

Report on mineral exploration activities in Québec



1998



Report on mineral exploration activities in Québec

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Cover: Photos of the Makamikex Exploration Company's new mineral discovery in northernmost Québec.

The Isabelle showing.

Project: Beaver

Locality: 23 M/07

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Foreword

The 1998 annual report on exploration activities presents Québec's mineral potential by geological provinces to better visualize the unique metallogenic settings of each project. Industrial minerals, construction materials and peat are dealt with in separate chapters from base and precious metals. Another chapter deals with exploration financial assistance programs managed by the ministère des Ressources naturelles.

The Abitibi Subprovince remains the main mining centre and the most explored region in Québec. In 1998, 12 gold mines and 5 polymetallic mines were in operation. During this period, 136 gold exploration projects represented investments of \$32M and 66 projects for base metals generated off-minesite expenditures of more than \$12M. A new financial assistance program, the deep drilling program in the Abitibi Subprovince, was launched in September 1998. Two new mines will come into production in 1999: the **McWatters Mines** East-Amphi deposit and the **Noranda Bell-Allard** deposit.

The 45 exploration projects carried out in the James Bay territory focussed mainly on base metals in the Frotet-Evans volcano-sedimentary belt and gold along the Eastmain and La Grande River greenstone belts. Recent James Bay discoveries should maintain interest for this territory and we foresee that companies involved will pursue their work in 1999. Exploration budgets were over \$6M in 1998. In 1999, the amount will depend on financing possibilities in a difficult market. The Québec government also offers its assistance to exploration in this sector through its Near-North mining exploration program.

In 1998, exploration investments of \$2.33M in the Labrador Trough and in the Rae Subprovince covered 15 projects. In the Ungava Trough, off-minesite exploration investments reached \$0.67M. The main substances searched for are magmatic deposits of Ni-Cu-PGE as well as VMS and SEDEX base metals deposits. In 1999, off-minesite exploration expenditures should remain similar to those of 1998 in the New-Québec orogen belt and in the Ungava belt. However, expenditures should decrease in the Rae Subprovince.

In 1998, the Far-North project generated significant fallout on exploration in the region. The MRN lake bottom sediment geochemical survey led to the discovery of an important number of geochemical anomalies and some of these areas were targeted for exploration work. Geological mapping at a scale of 1:250 000 was started in the summer of 1998 and it led to the identification of several new targets for exploration in this little-known territory. The "Fonds d'exploration minière du Nunavik", set up this year, benefited from the Native Peoples mining fund program for the Near-and Far-North regions.

In the St. Lawrence Lowlands and in the Appalachians, there is little exploration for base or precious metals. The most important work concerns industrial minerals, building stone and peat. However, the Québec financial assistance program for mining exploration ensures base level exploration activities.

Exploration in the industrial minerals sector is focussed on marble, dolomite, quartzite, apatite, ilmenite and diamond. In 1998, this sector was affected by a few closings due to the lower demand for asbestos, the depletion of quartz reserves and the marketing difficulties for wollastonite. More than \$2M were invested this year in diamond exploration, especially in the Far-North. The construction materials sector focus is on slate and cut stone. This year the weather conditions were unfavourable for peat extraction, especially in the lower St. Lawrence, on the North Shore and in the Saguenay-Lac-Saint-Jean regions.

Highlights

In Abitibi, development of zone 20 of the **Agnico-Eagle** LaRonde mine gives access to new reserves estimated at more than 6 Mt of Zn, Cu, Ag and Au.

In the Casa Berardi-Joutel-Matagami region, the results of a drilling campaign on the Casa Berardi gold project owned by **Aurizon Mines** are very encouraging.

Another interesting discovery took place in the Denain township near the Grenville front, where two prospectors discovered copper in an area not known for its massive sulphides.

In the Frotet region, the Troilus mine reserves are estimated at over 49 Mt; this deposit was brought into production in early 1997 by the **Inmet Mining Corporation**. In 1998, the company decided to enlarge the size of its mill in order to increase processing capacity.

In the Evans region, **Nuinsco Resources** drillings intersected a Ni and Cu mineralized zone with a geological inventory of 3 Mt. This discovery continues to generate much interest.

In the James Bay region, in the western La Grande area, **Virginia Gold Mines** continued its work on the La Grande Sud property in order to verify the extension of Zone 32 to a depth of 300 m.

In the Far-North, the **Société minière Raglan du Québec** operates an open pit and mines several massive sulphide lenses underground. Reserves of the Raglan deposit are estimated at 22 Mt. Production started at the end of 1997 and should last 25 years.

In the Rae Subprovince, **Falconbridge** and the **Cambior, Soquem, Virginia Gold Mines** consortium are searching for Cu-Ni-Co-PGE deposits east of George River.

In the Labrador Trough, **Inmet Mining Corporation**, in partnership with **Denison Mines** and **Virginia Gold Mines**, continued their exploration program on the Sagar project. The field of altered and angular blocks, with certain ones returning values up to 106 g/t Au and 1.31 % U, is found in a horst between Mistamisk Lake and Romanet Lake.

In the Minto block, **Falconbridge** followed up on a series of lake bottom sediment geochemical anomalies in its search for Ni-Cu-Co magmatic deposits.

In 1998, **BHP Minerals** undertook a vast geochemical and geophysical exploration reconnaissance program in the Minto block focussed on the search for VMS gold-bearing deposits, Ni-Cu magmatic deposits and diamond-bearing deposits.

In the Kogaluk volcano-sedimentary belt, **Virginia Gold Mines, Soquem** and **Boréale Exploration** have defined three important gold-bearing zones.

In the Gaspé Peninsula, **Mines Gaspé** is currently looking for copper-bearing porphyries, massive copper-bearing sulphide mantos and copper-bearing skarns near its Murdochville infrastructures.

Near Montreal, **Niocan** is continuing the development of its niobium deposit within the Colline d'Oka carbonate complex. The Niocan project consists in operating an underground mine and building a plant to transform pyrochlore concentrates into ferroniobium on site.

In the Chaudière-Appalaches region, near Thetford Mines, **Ressources Alcan** is carrying out a prefeasibility study to bring chrome-bearing deposits into production. This project includes the construction of a processing plant to transform chromite concentrates into ferrochrome.

The **Soquem** and **Norsk Hydro** project on the Sept-Îles apatite-ilmenite deposit is proceeding ahead with pilot plant testing on the ilmenite concentration process.



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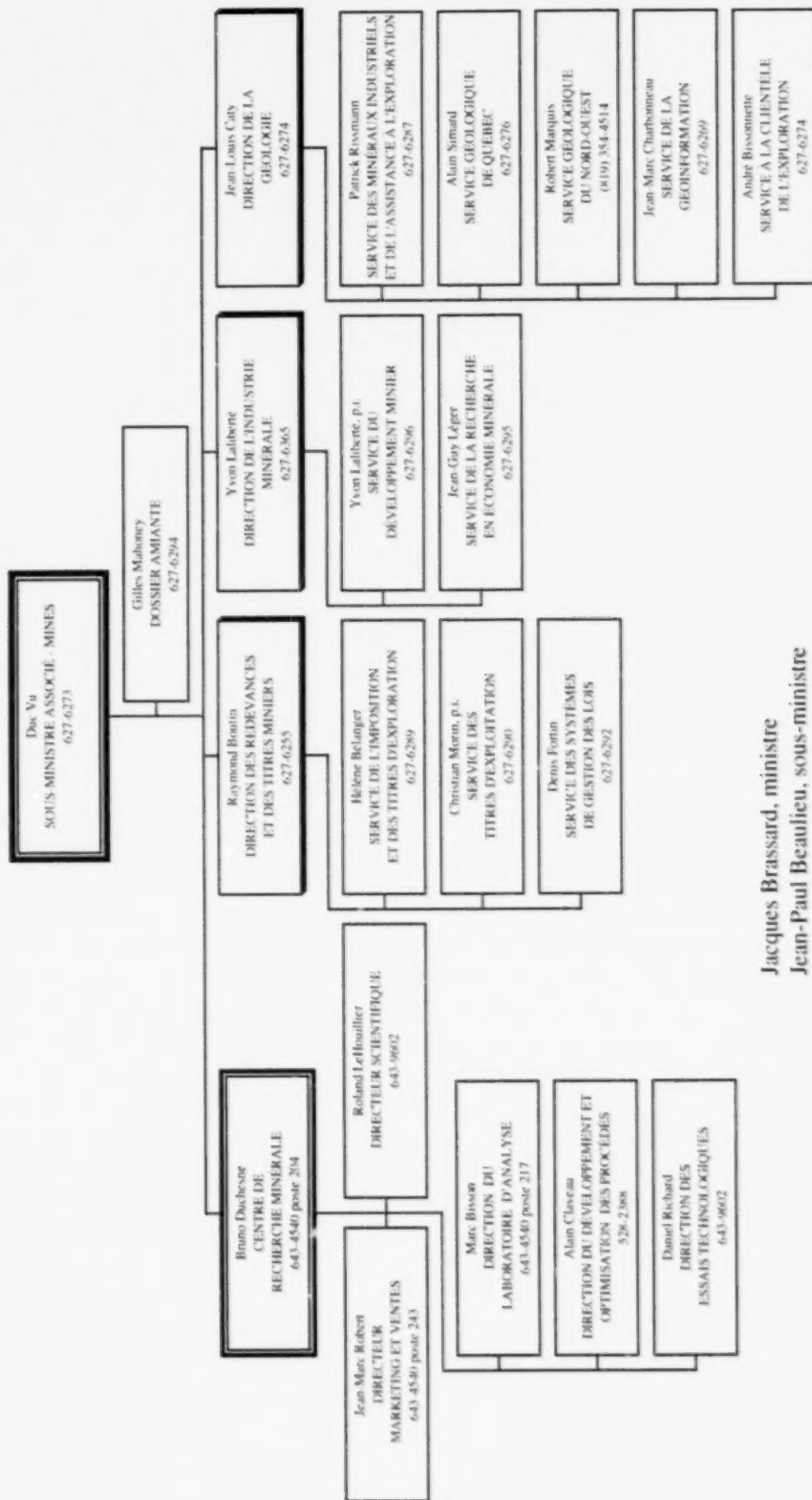
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Jean-Paul Beaulieu, sous-ministre

Le 16 décembre 1998

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CHAPTER 1

Base and precious metals



FIGURE 1 – Geological and territorial subdivisions used in this report.

1A

The northern part of the Superior Province (Minto, Bienville and Ashuanipi Subprovinces)

Roch Gaudreau

Bienville Subprovince	4
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Charras belt	4
Duquet belt	4
Kogaluk belt	4
Payne Belt	4
Venus belt	4
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The Ungava Peninsula region is vast and little explored, but its mineral potential is considered more and more interesting. In this region in 1998, \$3.1 M were invested in 36 mineral exploration projects.

Bienville Subprovince

The Bienville Subprovince consists mainly of orthogneiss with enclaves of supracrustal and plutonic rocks. **Virginia Gold Mines** and **Mackenzie Watson** continued an exploration campaign to evaluate the gold potential of the Fagnant volcano-sedimentary belt. (15; Figure 1A-1). A gold structure followed over more than 300 m graded up to 2.2 g/t Au over 6 m, including 3.4 g/t over 3 m.

Ashuanipi Subprovince

The Ashuanipi Subprovince is mainly composed of paragneiss (metatexites, diatexites), mafic metaplutonites and felsic orthogneiss (tonalitic, dioritic). In 1998, **Virginia Gold Mines** continued its exploration campaign to evaluate the porphyry-type Cu-Au-Mo mineral potential of the Bernard Lake area.

Minto Subprovince

The Minto Subprovince consists of plutonic and gneissic rocks and remnants of greenstone belts. In 1998, Géologie Québec mapping projects identified several new volcano-sedimentary belts unknown up to then.

Regional work

Falconbridge undertook a reconnaissance and prospecting campaign in the Minto Subprovince. This campaign was mainly designed to follow-up on a series of Ni-Cu-Co geochemical anomalies of lake bottom sediments. Falconbridge is searching for Ni-Cu-Co magmatic deposits associated with ultramafic complexes (12, 13, 14, 16, 21; Figure 1A-1). In 1998, **BHP Minerals** undertook a vast geochemical and geophysical reconnaissance exploration campaign covering NTS sheets no. 22, 23, 24 and 32 in the Near- and Far-North (8; Figure 1A-1). The Superior Recon Québec project focuses on searching for gold-bearing VMS, Ni-Cu magmatic deposits and diamond deposits. Within the scope of the Far-North project, **Soquem**, **Virginia Gold Mines** and **Cambior** co-ordinated their efforts to carry out reconnaissance and prospecting work. The consortium is looking for VMS deposits and epigenetic gold deposits (2, 5, 6, 7, 17, 30; Figure 1A-1), Ni-Cu-Co magmatic deposits (10, 11, 17, 22, 23, 27, 28, 32, 33; Figure 1A-1) and Olympic Dam type Cu-U deposits (11, 19, 20; Figure 1A-1).

CHARRAS BELT

Makamikex has discovered an important polymetallic mineralized zone on its Beaver property (3; figure 1A-1). The massive to semi-massive sulphides are in a pyroxenite dyke injected into an ultramafic volcanite. A channel sample returned 13.8 % Cu, 8.3 g/t Ag and 1.0 g/t Au over 6 m.

DUQUET BELT

This volcano-sedimentary belt has a width varying from 1 to 6 km and extends for about 50 km. It is characterized by a bimodal volcanism with calc-alkaline rhyolites and andesites. Several polymetallic showings were discovered by **Virginia Gold Mines** and **Soquem** at the edge of an early tonalitic intrusion (31; Figure 1A-1). The best surface sample returned 42.33 g/t Au, 553 g/t Ag, 0.46 % Cu, 1.46 % Pb and 7.50 % Zn.

KOGALUK BELT

The Kogaluk volcano-sedimentary belt extends over 100 km. It is made up of metasedimentary rocks, various iron formations and of calc-alkaline volcanic rocks. In this belt, **Virginia Gold Mines**, **Soquem** and **Boréale Exploration** have defined three important gold-bearing zones (34; Figure 1A-1). Drilling returned 4.9 g/t Au over 5.6 m.

PAYNE BELT

The western part of the belt is characterized by iron formation bands with oxides and silicates incorporated within metapelites. In 1997, **Virginia Gold Mines** and **Soquem** discovered an important gold structure on the Payne property (25; Figure 1A-1). The most promising zone, the Amaruk, returned channel samples grading 14.14 g/t Au over 4.9 m and 17.65 g/t Au over 3.45 m. A drill hole returned 4.74 g/t Au over 8.4 m.

VENUS BELT

In an ultramafic intrusion in the Gayot Lake region, **Virginia Gold Mines** uncovered a Ni-Cu showing that returned 1.96 % Ni and 0.91 % Cu (4; Figure 1A-1). This ultramafic intrusion is found within the Venus volcano-sedimentary belt.

Outlook

The start-up of the Far-North project by Géologie Québec had an immediate effect on exploration in the region. The lake bottom geochemical survey, published in November 1998, led to the targeting of a significant number of areas of geochemical anomalies. The geochemical data, combined with the data from the geological surveys of summer 1998, led to the definition of several potential targets that will surely be explored in 1999.

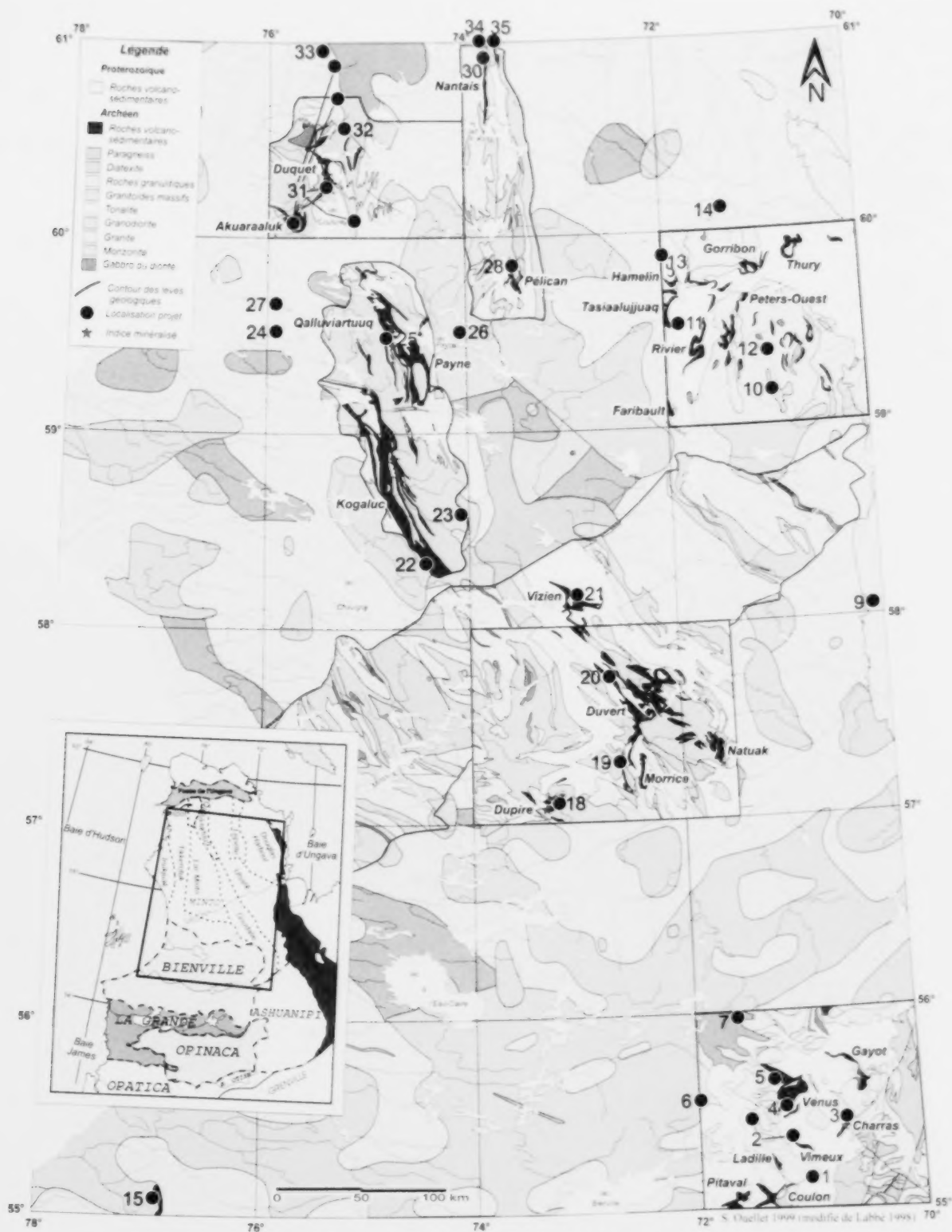


FIGURE 1A-1 : Exploration project sites in the MINTO-BIENVILLE-ASHUANIPI subprovinces in 1998.

TABLEAU 1A-1 – Exploration projects in the Ashuanipi, Bienville and Minto Subprovinces in 1998.

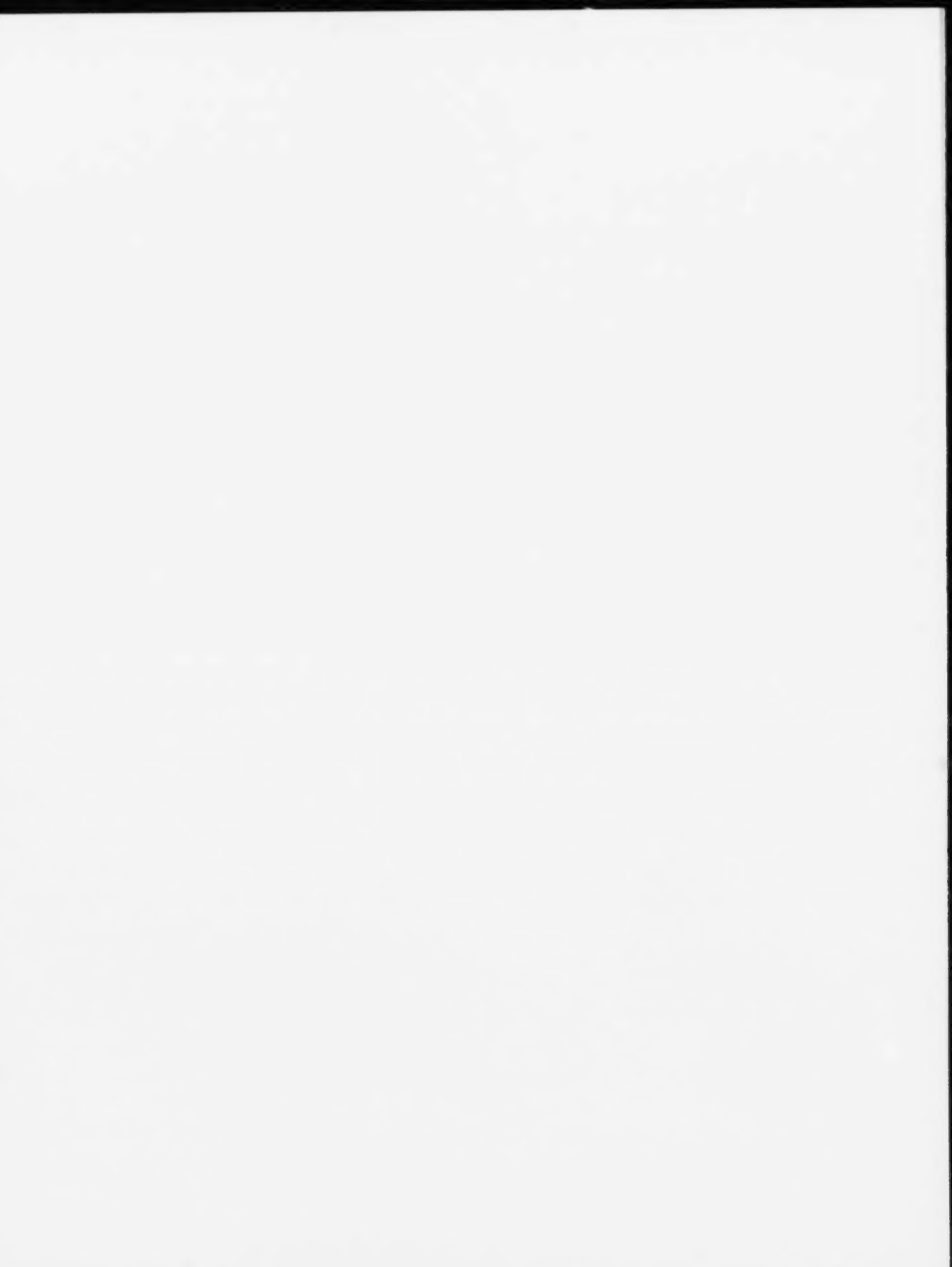
N°	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽¹⁾
1	23M/02-03	Soquem, Mines d'Or Virginia, Cambior	Laurac	Au, Cu	GpA(Mag-EM), Pr, E, Gc
2	23M/05-06	Soquem, Mines d'Or Virginia, Cambior	Delay	Au, Cu	GpA(Mag-EM), Pr, E, Gc
3	23M/11	Makamikex	Gayot	Cu-Ni-Au-Ag	Pr, E, G, T
4	23M/11	Mines d'Or Virginia	Lac Gayot	Ni-Cu-Co	Gp, G, Pr, E, T
5	23M/11	Soquem, Mines d'Or Virginia, Cambior	Chavamond	Au	GpA(Mag-EM), Pr, E, Gc
6	23M/12, 33P/09	Soquem, Mines d'Or Virginia, Cambior	Glinel	Au	GpA(Mag-EM), Pr, E, Gc
7	23M/13	Soquem, Mines d'Or Virginia, Cambior	Bazinière	Au, Cu	GpA(Mag-EM), Pr, E, Gc
8	24B-C-D-F, 23B-C-D-M-N-O, 22L-M-N, 32I	BHP Minerals	Superior Recon Québec	Au, Ni-Cu, (Diamant)	Gp, G, Pr, E, Gc
9	24L/01	Mines et Explo. Noranda	Lac Jourdan	Zn-Cu	Pr, E, Gc(s, ro, ru)
10	24M/02-03	Soquem, Mines d'Or Virginia, Cambior	Pajot	Ni-Cu	GpA(Mag-EM-Rad), Pr, E, Gc
11	24M/05-12	Soquem, Mines d'Or Virginia, Cambior	Olympic	Ni-Cu	GpA(Mag-EM-Rad), Pr, E, Gc
12	24M/06-07-08	Falconbridge	Grand-Nord, permis 1353	Ni-Cu	Gp, G, Pr, E
13	24M/13, 34P/16	Falconbridge	Grand-Nord, permis 1354	Ni-Cu	Gp, G, Pr, E
14	25D/03-04	Falconbridge	Grand-Nord, permis 1357	Ni-Cu	Gp, G, Pr, E
15	33N/02	Mackenzie Watson, Mines d'Or Virginia	Lac Fagnant	Au-Ag	Pr, E
16	34, 33 nord, 24 ouest, 23 ouest	Falconbridge	Reconnaissance Grand-Nord	Ni-Cu-Co	Pr, E
17	34, 35 sud, 33 nord, 24 ouest, 23 ouest	Soquem, Mines d'Or Virginia, Cambior	Reconnaissance Grand-Nord	Au-Cu-Ni	Pr, E
18	34H/03	Explo. Boréal, Mines d'Or Virginia, Soquem, Cominco	Dupire	Au	HEM
19	34H/07-08	Soquem, Mines d'Or Virginia, Cambior	Morrice	Au, U	GpA(Mag-EM-Rad), Pr, E, Gc
20	34H/15-16	Soquem, Mines d'Or Virginia, Cambior	Vernot	Au, U	GpA(Mag-EM-Rad), Pr, E, Gc
21	34I/02-03	Falconbridge	Grand-Nord, permis 1358	Ni-Cu	Gp, G, Pr, E
22	34J/01-08	Soquem, Mines d'Or Virginia, Cambior	Bacqueville	Ni-Cu-Pt-Pd	GpA(Mag-EM), Pr, E, Gc
23	34J08-09	Soquem, Mines d'Or Virginia, Cambior	Bisson	Ni-Cu-Pt-Pd	GpA(Mag-EM), Pr, E, Gc
24	34N/09-16, 34O/12-13	Soquem, Mines d'Or Virginia	Mézard	Au	G, Pr, E
25	34O/07 à 10	Soquem, Mines d'Or Virginia	Payne	Au, Cu-Zn	Pr, Gp, G, T
26	34O/08-09	Soquem, Mines d'Or Virginia	Pavy	Au	Pr, E, G
27	34O/12	Soquem, Mines d'Or Virginia, Cambior	Mézard-centre	Ni-Cu-Pt-Pd	GpA(Mag-EM), Pr, E, Gc
28	34P/13-14	Soquem, Mines d'Or Virginia, Cambior	Pélican	Zn-Cu, Ni-Co	GpA(Mag-EM), G, Pr, E, Gc
29	35 sud, 24 ouest	Mines et Explo. Noranda	Reconnaissance Grand-Nord	Zn-Cu	Pr, E
30	35A/13	Soquem, Mines d'Or Virginia, Cambior	Nantais	Au, Cu	GpA(Mag-EM), Pr, E, Gc
31	35B/03 à 06, 11, 12	Soquem, Mines d'Or Virginia	Duquet	Cu-Zn-Pb-Au-Ag	Gc(s), G, Pr, E
32	35B/11	Soquem, Mines d'Or Virginia, Cambior	Duquand	Au, Cu	GpA(Mag-EM), Pr, E, Gc
33	35B/14	Soquem, Mines d'Or Virginia, Cambior	Allemand	Au, Cu	GpA(Mag-EM), Pr, E, Gc
34	35H/04	Explo. Boréal, Mines d'Or Virginia, Soquem, Cominco	Kogaluk	Au	G, Pr, E

TABLEAU 1A-1 – (continued)

N°	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽¹⁾
35	35H/04	Explo. Boréal	Nantais	Au	Pr, G, E
36	23F/06	Mines d'Or Virginia	Lac Bernard	Cu-Au-Mo	Gc, Pr, E

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DPEM	Levé électromagnétique	Gp	Levé géophysique non défini
E	Échantillonnage	GpA	Levé géophysique aérien
EF	Étude de faisabilité et/ou de marché	Mag	Levé magnétométrique
EM	Levé électromagnétique	PEM	Levé électromagnétique de type «pulse»
ET	Étude d'évaluation technique	PP	Levé de polarisation provoquée
Ev	Échantillonnage en vrac	Pr	Prospection
G	Levé géologique	S(nb.m)	Sondage au diamant (nombre : m total)
Gc	Levé géochimique non défini	Sci	Sondage de circulation inversée
Gc(h)	Levé géochimique d'humus	T	Excavation de tranchée et décapage
Gc(l)	Levé géochimique de fond de lac	TBF	Levé électromagnétique basse fréquence
Gc(ro)	Levé géochimique de roches	TM	Test métallurgique
Gc(ru)	Levé géochimique de ruisseaux	*	Travaux d'exploration réalisés au chantier
Gc(s)	Levé géochimique de sols	gras	Projet à l'étape de mise en valeur
Gc(t)	Levé géochimique de till	Envir	Travaux de restauration environnemental
☐	Projet subventionné par le MRN		



1B

The James Bay region : The central part of the Superior Province (Opatica, Opinaca, Nemiscau and La Grande Subprovinces)

Rémy Morin

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Exploration investments in the James Bay territory totalled \$6.05 M in 1998, including Québec government financial assistance of \$1.86 M through its Programme d'exploration du Moyen-Nord. A total of 27 604 metres were drilled and at least 45 exploration projects are listed. Exploration works were mainly focussed within the Frotet-Evans, the Eastmain River and the La Grande River volcano-sedimentary rocks.

Frotet-Evans region

The eastern part (Frotet sector) of this region is well-known for its massive sulphide showings and deposits, several of which were discovered in the last years. The **Noranda** Tortigny deposit, with a geological inventory estimated at 531 000 tonnes grading 3.59 % Cu, 6.49 % Zn, 85.23 g/t Ag, 0.43 g/t Au and 0.27 % Pb is worth mentioning, as are the **Soquem** De Maurès deposit, with 350 000 tonnes grading 7.84 % Zn, 1.35 % Cu and 22.31 g/t Ag, and the **Inco** PK Zone. The discoveries of the last years show the vast potential for this type of mineralization, while exploration is at a quite low level. In the northern part of the sector, the start-up of the **Inmet Mining Corp.** Troilus mine in early 1997 is witness to the gold potential of this sector. The Troilus deposit include two mineralized zones, 87 and J4, with reserves evaluated at 49 590 000 tonnes grading 1.38 g/t Au, 0.12 % Cu and 1.23 g/t Ag. In 1998, the company decided to enlarge the size of its mill to increase processing from 11 000 t/d to 15 000 t/d. In the western part of the Frotet-Evans belt (Evans sector), **Nuinsco Resources** (15; Figure 1B-1) intersected a mineralized zone with a geological inventory estimated at 3 Mt grading 0.5 % Ni and 0.2 % Cu. **Soquem** and **Altavista Mines** (16; Figure 1B-1) report discovering several Cu-Zn-Pb-Ag mineralized showings associated with iron formation and cherts.

Eastmain region

Eastmain Resources, **Barrick Gold Corporation**, **Virginia Gold Mines** and **Soquem** are the main companies involved in the Eastmain River sector. On the Clearwater property, (23; Figure 1B-1), **Soquem** and **Eastmain Resources** intersected several quartz-tourmaline gold-bearing veins to the west of known zones. (Eau Claire deposit with

270 000 tonnes grading 6.1 g/t Au). The best values grade between 11.21 and 21.2 g/t Au on widths varying from 0.4 m to 1 m.

La Grande region

In the western sector of La Grande, **Virginia Gold Mines** continued its work on the La Grande Sud property (32; Figure 1B-1) where, in 1997, it had discovered Zone 32 in a sheared zone at the contact between basalts and a tonalitic stock. **Virginia Gold Mines** estimates the geological reserves of this zone at 2 104 833 tonnes grading 2.89 g/t Au (cut-off grade of 1.5 g/t Au, November 1997). The work carried out in 1998 brought forth a new mineralized zone (Veine Zone) and verified the extension of Zone 32 down to a depth of 300 m. Channel sampling of the Veine Zone, located 200 m to the north of Zone 32, returned up to 19.64 g/t Au over 3 m.

In the eastern La Grande area, the main exploration works were made by **Sirios Resources** (39, 40, 43, 44, and 45; Figure 1B-1), the duo **Virginia Gold Mines and Boreal Exploration** (37; Figure 1B-1) as well as **Virginia Gold Mines** and **Silver Century Explorations** (36; Figure 1B-1). On the Aquilon property (45; Figure 1B-1), located at about ten kilometres to the south of the LA-1 hydroelectrical power plant, **Sirios Resources** returned interesting gold values grading between 1.3 and 25.4 g/t Au along a lateral horizon that extends about 7 km. Mineralization is in the form of disseminated sulphides or quartz veins in altered and sheared felsic volcanic rocks. On the Poste Lemoyne property, the duo **Virginia Gold Mines and Boreal Exploration** (37; Figure 1B-1) discovered a new gold-bearing showing in silicated and oxidized iron formations. The semi-massive mineralization forms pyrrhotite and pyrite beds with traces of chalcopyrite. The best values graded 67.35 g/t Au over 1 m and 21.57 g/t Au over 5 m.

Outlook

In conclusion, the discoveries on the James Bay territory should maintain the interest for this area. Most of the companies should continue their work in 1999 with similar exploration budgets if the financial conditions are favourable.

Tableau 1B-1 – Exploration projects carried out in the James Bay region in 1998 (see figure 1B-1).

N°	SNRC	COMPAGNIE	PROJET	SUBSTANCE	TRAVAUX ⁽¹⁾
1	32J/09 et 32J/10	SOQUEM INC	Clairy	Cu-Zn	Gp
2	32J/10 et 32J/15	Norex	Bande Troilus	Au-Cu-Zn	Pr
3	32J/10	SOQUEM INC et Ressources MSV	Tortigny Est	Cu-Zn	Gp, S(2: 636)
4	32J/10	Ressources Sirios	Monique	Cu-Zn	Gp, G, T
5	32J/10	Ressources Sirios	Clairy	Cu-Zn	G, T
6	32J/10	Ressources Sirios	Chalonneau	Cu-Zn	G
7	32J/10	SOQUEM INC	Christiane	Zn-Cu-Au-Ag	T, S(8: 1713)
8	32J/11	Cominco	Garevan	Cu-Zn	Gp, S(4: 323)
9	32J/11	Piétro Costa		Au	Pr
10	32J/11	SOQUEM INC et Pangea Goldfield	Assinica	Cu-Zn	G, Pr, S(7: 2181)
11	32J/11	Native Exploration		Cu-Zn	Pr
12	32J/15	SOQUEM INC	Troilus Free Gold	Au-Cu	Gp, Gc
13	32J/15	SOQUEM INC	Melanie	Zn-Cu-Au-Ag	Gp, T
14	32J/15 et 32O/01	Corporation minière Inmet	Troilus	Au	Gc
15	32K/09	Nuinsco Resources	Lac Rocher	Ni-Cu-Pt	Gp, S(10: 1209)
16	32K/09 et 32K/16	SOQUEM INC et Mines Altavista	Quenonisca	Zn-Cu-Au-Ag	G, Pr
17	32K/15 et 32K/16	Ressources SearchGold	Storm	Au	S(16: 2500)
18	32K/10	Ressources SearchGold	Scott	Au	Gp, G, T
19	32K/15	Cominco	Corbevan	Cu-Zn	Gp, S(5: 601)
20	32K/16 et 32K/09	Cominco	Kenevan	Cu-Zn	Gp, S(8:1220)
21	32K	Cambior	Moyen-Nord	Au-Cu-zn	Gp, G, Pr
22	33B/03	Mines d'Or Virginia	Auclair	Au	S(7: 1000)
23	33B/04	Eastmain Resources et SOQUEM INC	Clearwater	Au	Gc, G, S(14: 2610)
24	33C/01	Léo Audet	Eastmain	Au	Gp, Pr
25	33C/01	Mines d'Or Virginia et Silver Century Expl.	Lac Opinaca	Au	Gp, G
26	33C	Orezone Res. et Eastmain Res.	Lac Delta	Au	S(8: 744)
27	33C/05	Société aurifère Barrick et Eastmain Res.	Lac Elmer	Au	PP, S(15: 3217)
28	33C/07	Exploration Opawica	Eastmain	Au	GpA
29	33D/15	Cree Nation of Wemindji	Wemindji	Au-Cu-Zn	Pr
30	33F/05	Mines d'Or Virginia	Lac Duncan	Au	Pr, Gc(t)
31	33F/04 et 33F/06	Ressources Dianor	Yasinski	Au-Cu-Ag	Pr
32	33F/09	Mines d'Or Virginia	La Grande Sud	Au	Gc(t), G, T, S(40: 8650)
33	33F/09 et 33F/10	Mines d'Or Virginia	Lac Long	Au	Gp
34	33F/09	Orezone Resources	La Grande Est	Au	Gp
35	33F/10	Noranda inc et Mines d'Or Virginia	La Grande Nord	Cu-Zn	PP, Pr
36	33G/08	Mines d'Or Virginia et Silver Century Expl.	Corvet et lac Guyer	Au	Gc(t), Pr
37	33G/08	Exploration Boréale et Mines d'Or Virginia	Poste Lemoyne	Au	S(7: 1000)
38	33G/08, 33G/09 et 33G/10	Exploration Boréale	Pontois	Au	G
39	33G/16	Ressources Sirios	Tilly	Cu-Mo-Au	G
40	33H/09	Ressources Sirios	Escale	Cu-Mo-Au	Gc(t)
41	33H/10	Makamikex L.G.	Béric	Au-Cu-Zn	Gc, Pr
42	33H/08 et 33H/09	Mines d'Or Virginia et Cambior	Caniapiscau	Au-Cu-Zn	Pr, GpA
43	33I/01 et 3I/02	Ressources Sirios ET SOQUEM INC	Tilly-centre	Au-Ag-Cu-Zn	Gp, Gc, G
44	33I/01 et 3I/02	Ressources Sirios	Tilly-sud	Au-Ag-Cu-Zn	Gc, G
45	33I/01 et 3I/02	Ressources Sirios	Aquilon	Au-Ag-Cu-Zn	Gp, G, T, Gc(t)

LEGENDE: **Pr**: prospection; **G**: levé géologique; **Gp**: levé géophysique au sol ou en forage; **GpA**: levé géophysique aérien; **Gc**: levé géochimique; **Gc(t)**: géochimie de till; **E**: échantillonnage; **Ev**: échantillonnage en vrac; **ET**: étude technique et compilation; **EF**: étude de faisabilité; **S**: sondage (nombre de trous: nombre de mètres forés); **Sci**: sondage de circulation renversée; **T**: tranchée et décapage; **TM**: test de métallurgie.

☐ Projet subventionné par le MRN

1C

The northern part of the Superior Province (Abitibi and Pontiac Subprovinces)

Chantal Dussault
Pierre Doucet

The Abitibi region is the most important mining centre in Québec. It is known for its numerous and rich precious metals (Au-Ag) and polymetallic deposits (Cu, Zn, Au, Ag). In 1998, there were twelve gold mines and five polymetallic mines in operation. Together, they produced 33 499 kg of gold, 87 250 tonnes of copper and 175 545 tonnes of zinc. Two new mines should open in 1999: East-Amphi (95) is owned by **McWatters Mines**, it has indicated resources estimated at 1 967 000 tonnes at 6.38 g/t Au; Bell-Allard, in Matagami, is owned by **Noranda**; it will come into production in the spring of 1999. Reserves are estimated at 3 172 457 tonnes grading 13.77 % Zn, 1.5 % Cu, 43.45 g/t Ag, 0.76 g/t Au.

In 1998, the Abitibi remained the most explored region in Québec. A total of 9008 new claims were staked. Exploration investments rose to \$44.1 M covering 202 projects. The nature and the location of these various projects are listed in Tables 1C-1 and 1C-2 and in Figures 1C-1 to 1C-5. Eighty-two projects were subsidized by the Québec ministère des Ressources naturelles, for a sum of \$1.6 M. A new program to support exploration started in 1998. It is focussed on deep drill holes, i.e. over 400 m. Forty-three drill holes were subsidized for a total of \$0.8 M. Gold exploration accounted for 136 projects (\$32 M), base metals exploration accounted for 66 projects and \$12.1 M in expenditures.

Once again the area most explored for gold is the Val-d'Or-Matagami sector (Figure 1C-5) with 28 projects. Three of these projects required investments of more than \$1M. An investment of \$1 M will allow open pit mining of the East-Amphi project (95) owned by **McWatters Mines**. Less than 5 km from Val-d'Or, **Mines Western Québec** invested over \$4 M to develop the Wesdome deposit. Resources are evaluated at 2.8 Mt grading 4.4 g/t Au. **McWatters Mines** invested several million dollars to develop three lenses on the Sigma mine mining concession: Westplug (133) Main Plug (134) and Sigma 3 (21). Doyon Mine, the largest gold producer, is in the Rouyn-Noranda-Cadillac sector (Figure 1C-4). Twenty four gold projects were located in

this sector. The main project is without a doubt the LaRonde Mine development of Zone 20 by **Agnico-Eagle**. The reserves for this new zone are estimated at 6 074 357 tonnes grading 6.05 % Zn, 0.26 % Cu, 2.77 g/t Ag, 0.7 g/t Au. Twenty five gold projects are listed in the Casa Berardi-Joutel-Matagami region. (Figure 1-C3). Drilling for the **Aurizon Mines** Casa Berardi project was very successful with intersections grading up to 6.5 g/t Au over 37.6 m. The Urban-Barry sector attracted several junior companies looking for high-tonnage shallow deposits. Nine projects are in the vicinity of Chibougamau with Soquem the most active in this sector. Soquem returned excellent results on the Brosman property in McKenzie township; one drill hole intersected 5.87 g/t Au over 5.5 m.

Matagami is the most explored region for base metals; the high grade of its zinc mines is known world-wide (the mean grade for deposits is 15 % Zn). In this region, the **Noranda-Southern Africa Minerals** Caber and Caber Nord projects required the greatest investments. Following the 1998 drilling campaign, the combined resources of the two sites are evaluated at 825 000 tonnes grading 12.3 % Zn, 1 % Cu and 15 g/t Ag. On Québec's western border, **Cancor Mines** continued its work on the Gemini property. One 8.76 m intersection graded 12.29 % Zn, 0.19 % Cu, 2.29 % Pb, 208.16 g/t Ag and 1.15 g/t Au. In the La Sarre region, **Amblin Resources** and **Globex Mining** returned excellent results near the old Lyndhurst mine; nearly 20 m of massive sulphides were intersected. At the end of 1998, Messrs. Duval and Boudreault discovered a copper showing in Denain township. This discovery was quickly optioned by **Moss Resources**. A channel sampling returned 1.47 % Cu over 5.35 m.

We are convinced the Abitibi will remain a world-class mining region for the next few years. The Abitibi greenstone belt has vast potential, yet several sectors are still under-explored. The Québec government also gives substantial financial assistance and encourages prospectors and mining companies through various financial assistance programs.

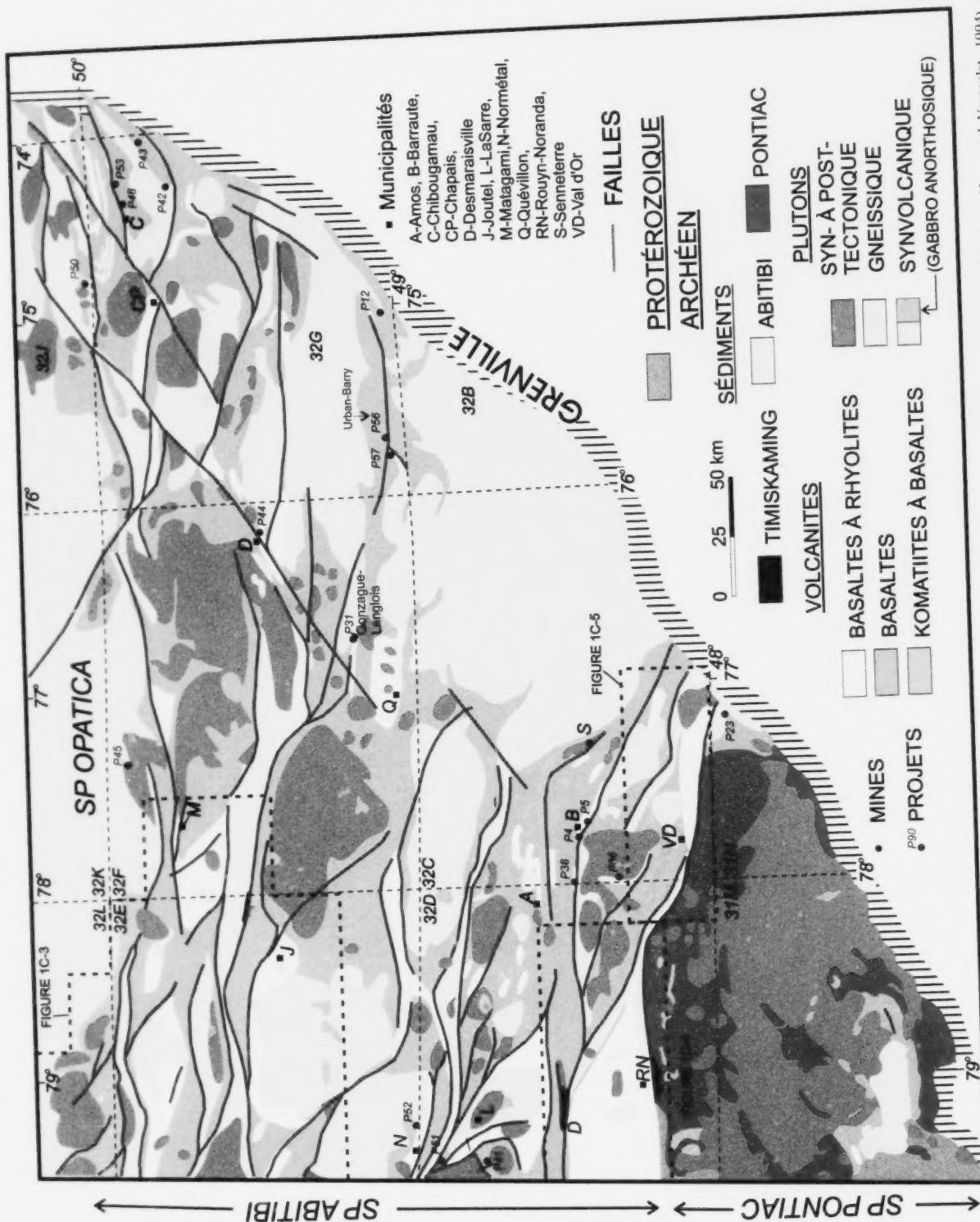


FIGURE 1C-2 – Exploration and mining sites for polymetallic substances in the Abitibi and Pontiac subprovinces (Geology modified from Hocq and Verpaetst, 1994).

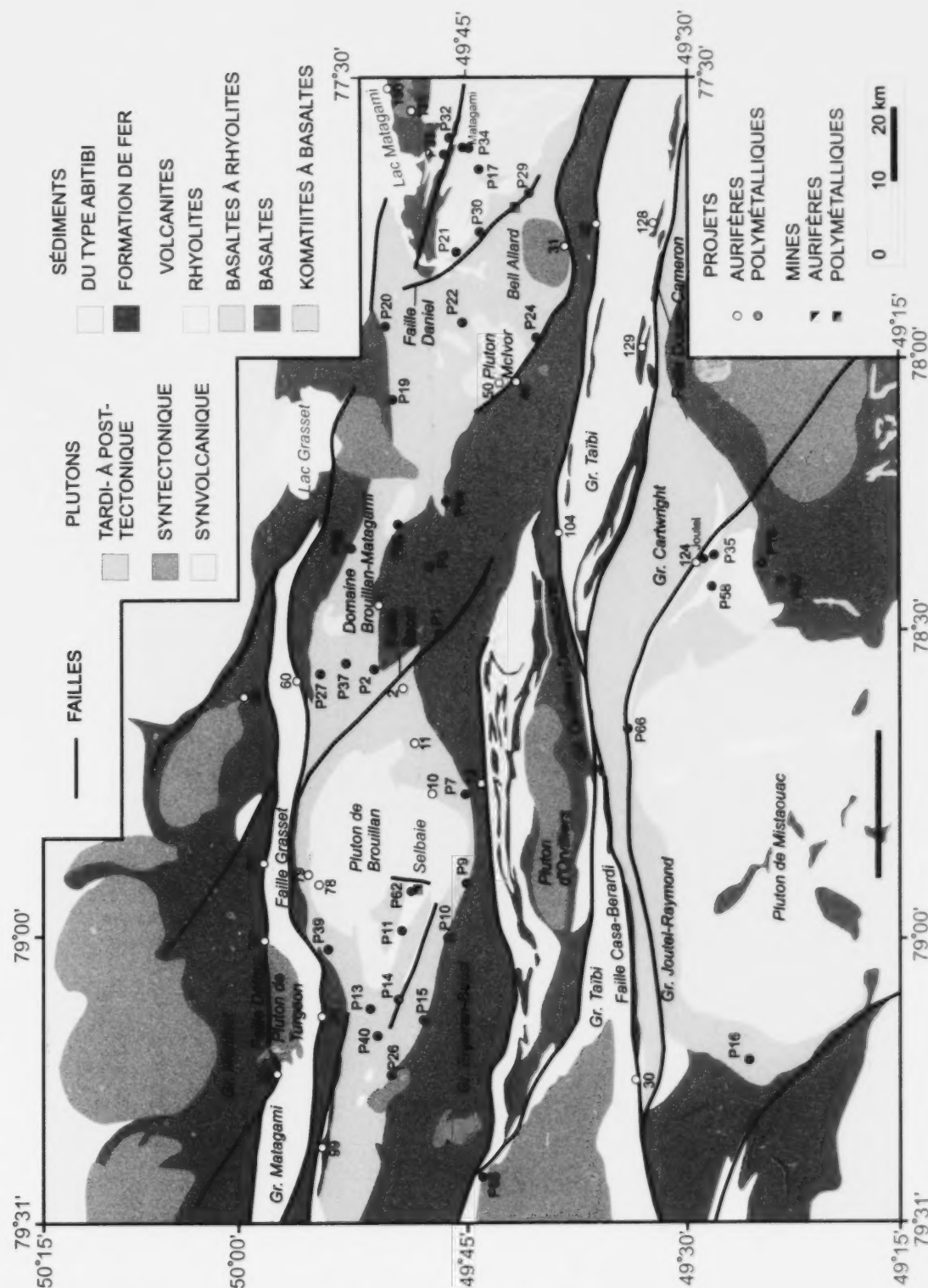


FIGURE 1C.3 — Exploration and mining sites in the Fenchon-Matagami-Casa Berard-Joutel sector (Geology modified from Lacroix *et al.*, 1990).

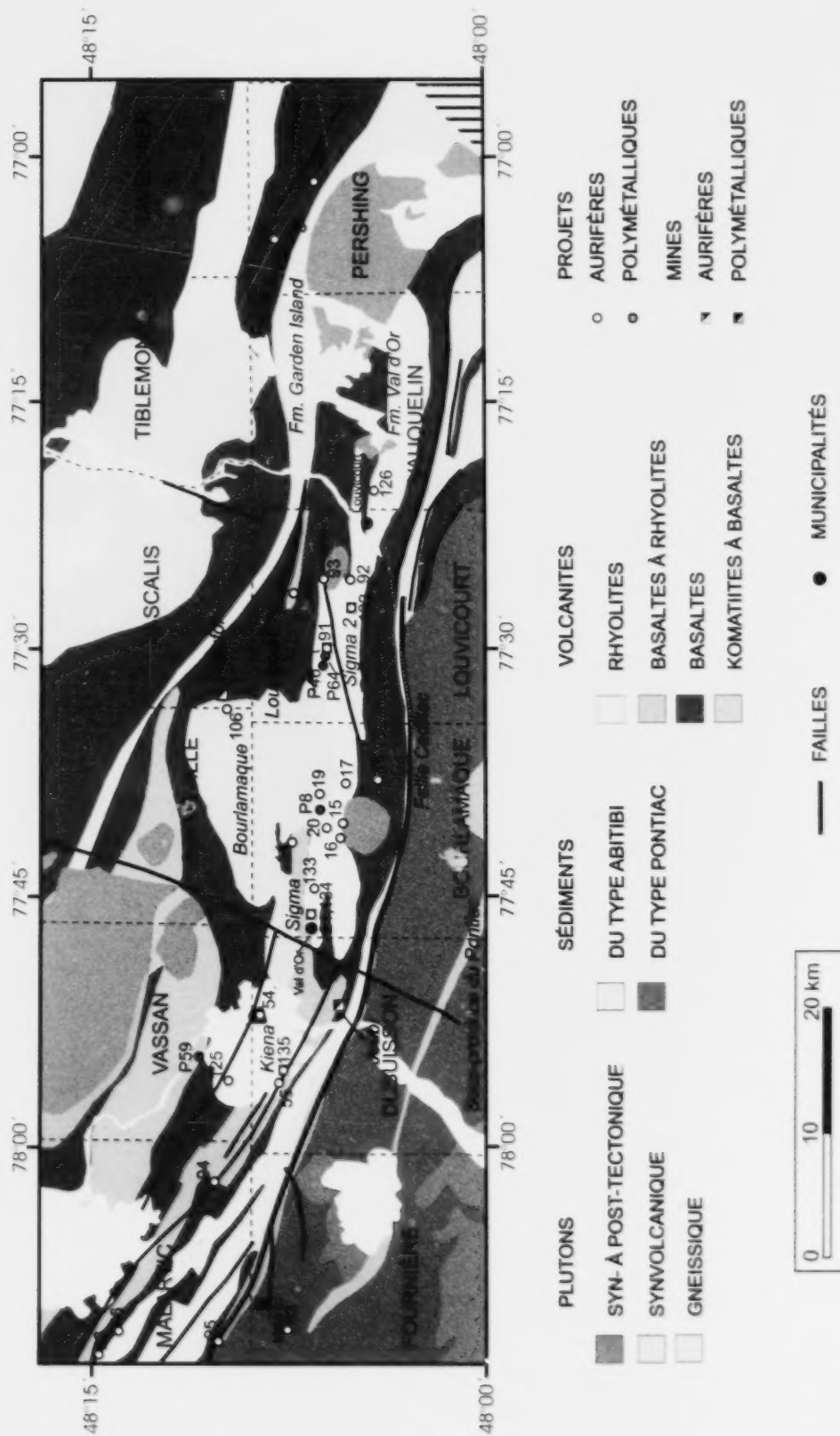


FIGURE 1C-5 Exploration and mining sites in the Malartic - Val d'Or sector (Geology modified from Avramichew et Lebel-Drolet, 1981; Couture, 1991).

Tableau 1C-1 – List of exploration projects for gold carried out in the Abitibi Subprovince in 1998.

N°	CANTONS	FIG.	INTERVENANTS	PROJETS	SUBS.	TRAVAUX ^m
1	Bapst	1C-3	SOQUEM	Bapst (1198)	Au,Cu,Zn	S(2:849),Mag
2	Bapst	1C-3	Billiton Métaux Canada	B-25	Au	S(3:612)
3	Barraute	1C-1	Mines Abcourt	Abcourt-Barvue-Vendôme	Au,Zn	G,TM
4	Barry/Bailly	1C-1	Ressources Xemac	Lac Barry	Au	S(13:2781)
5	Beauchastel	1C-4	Mines Richmond	Francoeur	Au	S(25:2943)
6	Beauchastel	1C-4	Exploration Maude Lake	Lac Arnoux	Au,Cu,Zn	S(3:512)
7	Beauchastel	1C-4	Ressources minières Vior	Beauchastel	Au,Cu	S,Gp
8	Beauchastel	1C-4	Mines Richmond	Wasamac	Au	S(1:635)
9	Berthiaume	1C-1	Syndicat Berthiaume	Berthiaume	Au	S(7:1025)
10	Beschefer	1C-3	Billiton Métaux Canada	B-14	Au	S(5:1506),PEM
11	Beschefer/Bapst	1C-3	SOQUEM/Billiton Métaux Canada	Beschefer (1172-1)	Au,Cu,Zn,Ag	S(10:2892)
12	Beschefer	1C-3	Ressources Yorbeau	Casa-Berardi	Au,Cu,Zn,Ag	S(5:1656),Mag,PP,PEM
13	Blondeau	1C-1	Ressources Dianor	Blondeau	Au	S(7:240),Pr,Gc(s)
14	Bourlamaque	1C-5	2973090 Canada	New Bid Lamaque	Au,Cu	S(1:111)
15	Bourlamaque	1C-5	Ressources Aur	Val-D'or Compilation	Au,Cu,Zn,Ag	G
16	Bourlamaque	1C-5	Ressources Aur	Général	Au,Cu,Zn,Ag	G
17	Bourlamaque	1C-5	Ressources Aur	Auriac	Au,Cu,Zn,Ag	S(4:3473),PEM,Gc(ro)
18	Bourlamaque	1C-5	Ressources Aur	Annamaque-Texsol	Au	S(3:3123)
19	Bourlamaque	1C-5	Ressources Aur	Standard Gold	Au,Cu	S(5:2578)
20	Bourlamaque	1C-5	Ressources Aur	Orezone	Au	S(5:2387)
21	Bourlamaque	1C-5	Mines McWatters	Sigma III	Au	S(79:3980),S(43:2710)
133	Bourlamaque	1C-5	Mines McWatters	Westplug	Au	S(29:7551)
134	Bourlamaque	1C-5	Mines McWatters	Sigma	Au	S(7:1873)
22	Bousquet	1C-4	Cambior	Doyon	Au	G,S(23:4861)
23	Bousquet	1C-4	Cambior	Mouska, Authier	Au	S(11:-3877),T,G
24	Bousquet	1C-4	Mines Agnico-Eagle	Mine Donald J.-Laronde Zone 20N	Au,Cu,Zn,Ag	S
25	Cadillac	1C-4	Mines Agnico-Eagle/Cogema	Lac Revillard	Au	S(7:1985)
26	Cadillac/Malartic	1C-5	Norcal Resources	Héva-Malartic	Au	G,Gc(s),S(6:1000),Mag
27	Cadillac	1C-4	Ressources minières Radisson	O'Brien	Au	S(7:1949)
28	Cadillac	1C-4	Amblin Resources	Wood-Cadillac	Au	S(4:1500)
29	Carpiquet	1C-1	Ressources Orient	Carpiquet-Panache	Au	S(3:441)
30	Casa Berardi	1C-3	Mines Aurizon	Casa Berardi	Au	S(36:20 000)G,PP,Gc(ro)
31	Cavellier/Galinée	1C-3	SOQUEM	Cavellier-1(1225)	Au,Cu,Zn	S(2:366),Mag,PP,TBM
32	Cavellier	1C-3	SOQUEM/Ressources Diabex	Cavga (1133)	Au,Cu,Zn	Mag, Pr
33	Chazel	1C-1	Ressources minières Radisson	Chazel	Au,Ag	Mag,Pr,G
34	Chaste	1C-1	Cambior/Mines Aurizon	Géant-Dormant	Au	S(5:2004),Gp
35	Clerion	1C-1	Robert Campbell	Southview 1	Au,Ag	Mag,TBF,G,Pr
36	Coigny	1C-1	D. Cyr/P.Larivière	Coigny	Au	Pr
37	Comtois	1C-1	Exploration Maude Lake	Comtois	Au,Cu,Zn	T,Gc(Ro)
38	Comtois	1C-1	Phelps Dodge Corp.Canada	Comtois	Au,Cu,Zn	Mag,PP,Gp
39	Courville	1C-1	Ressources Autanabi	Courville	Au	G
40	Courville	1C-1	A.G. Garneau	Courville-Garneau	Au	Mag,TBF,Gc(sol)
41	Courville	1C-1	Ressources Jordan	Courville-Antonic	Au	Mag,TBF
42	Dalquier	1C-1	Fieldex Exploration/D. Cyr	Dalquier I	Au	S(2:?)
43	Dalquier	1C-1	D. Cyr	Dalquier II	Au	Gp
44	Dasserat	1C-4	Ressources Dasserat	Lac Fortune Ouest	Au	S(16:885),TM
45	Dasserat	1C-4	Exploration Loubel	Dasserat	Au	S
46	Denain	1C-1	Moss Ressources	Duval-Boudreault	Au,Cu	G,T
47	Desjardins	1C-1	SOQUEM/Ressources Diabex	Desjardins	Au	Gc(s)
48	Desjardins	1C-1	SOQUEM/CANCOR	Desjardins	Au	Gc(s)
49	Desmazures	1C-3	SOQUEM/Billiton Métaux Canada	B06-20 McIvor	Au,Cu,Zn	S(3:1110),PP,Mag,Gc(ro)
50	Desmazures	1C-3	SOQUEM/Billiton Métaux Canada	SG1 (1213)	Au,Cu,Zn	S(1:597),PEM

Tableau 1C-1 - (continued)

N°	CANTONS	FIG.	INTERVENANTS	PROJETS	SUBS.	TRAVAUX ⁽ⁿ⁾
51	Despinassy	1C-1	Major General Resources	Despinassy	Au	S(7:1389),PP
52	Destor	1C-4	Cambior	Lépine-Bassignac	Au	S(5:2027)
53	Disson/Chazel	1C-1	Ressources Radisson	Disson	Au,Ag	S(1:302),Mag,PP,G
54	Dubuisson	1C-5	Mines Dynacor	Siscoe	Au	S(6:3756)
55	Dubuisson	1C-5	2883953 Canada	Kiena ouest	Au	G
135	Dubuisson	1C-5	Mines McWatters	Kiena	Au	Gc(ro)
56	Ducros	1C-1	C.-D. Fortin	Ducros	Au	Gp,Gc(ro)
57	Durpras/Beauchastel	1C-4	Azimuth/Cambior	Flavrian	Au	Pr,E,S(20:2400)
58	Dussieux, Morris	1C-1	SOQUEM	Olga (1029)	Au	Gp,Pr
59	Fénelon	1C-3	Exploration Fairstar	Fénelon	Au	TM
60	Fénelon	1C-3	Exploration minières du Nord	Fénelon	Au	Gp,G
61	Figuery	1C-1	Sulliden	Figuery	Au,Cu,Zn	S(? :600),PP
62	Fournière	1C-5	Ressources Dianor	Fournière	Au	G,Pr
63	Gamache	1C-1	Mines Altavista/SOQUEM	Philibert	Au	G
64	Gand	1C-1	SOQUEM	Gandex (1232)	Au	(S22:2601)
65	Grevet	1C-1	SOQUEM/Normabec	Cameron	Au	Pr,Gc(ro)
66	Grevet	1C-1	Cambior	Grevet	Au,Cu,Zn (volet cr)	G
67	Guercheville	1C-1	SOQUEM/Exploration Boréale	Guercheville (1196)	Au,Cu	Mag,PP,T
68	Guercheville	1C-1	Exploration Boréale/ Arca Explorations	Fenton	Au,Cu	G,T,S(25:3240)
69	Guillet	1C-1	Cambior	Belleterre	Au	G
70	Guillet	1C-1	Ressources Autanabi	Guillet	Au	T
71	Hébécourt	1C-4	Cambior/Cogema	Porcupine	Au	S(9:4318)
72	Joannès	1C-4	Ressources Xemac	Joannès	Au	Mag,TBF
73	Joannès	1C-4	Gordon Henriksen	Joannès	Au,Ag,Cu	Mag,TBF,Pr,G
74	Joannès	1C-4	Mines Agnico-Eagle	Joannès	Au	S(? :987)
75	Lacroix	1C-1	Ressources Xemac	Lacroix	Au	Mag,TBF
76	Lanouillier	1C-3	SOQUEM	B02 (1177)	Au	S(6:1715),Mag,PP
77	Lanouillier/Gaudet	1C-3	Billiton Métaux Canada	B03	Au	S(3:702),PP,Pr
78	Lanouillier	1C-4	Billiton Métaux Canada	B11	Au	S(1:165),PP
79	Lanouillier	1C-3	Billiton Métaux Canada	B27	Au	S(1:200),PP,Pr
80	La Pause	1C-4	Mines Agnico-Eagle/Écudor	La Pause	Au	T,Gp,G
81	La Peltre	1C-3	SOQUEM	La Peltre (1197)	Au	S(8:1978),PP,Pr
82	La Reine	1C-1	Mines Altavista	Santa Anna	Au	G,S(10:1338)
83	La Roncière	1C-1	SOQUEM	Relique (1137)	Au	S(2:231),PP,Gc(ro)
84	Lespérance	1C-1	Exploration minière du Nord	Lespérance Bloc ouest	Au	Gp,S,Gp
85	Lepinay	1C-1	Makamikex	Carcajou	Au,Zn	Gp,Gc(h)
86	Le Sueur	1C-1	SOQUEM/Expl. minière du Nord/ Cambior	Lespérance (1194)	Au	S(23:3944),Mag,PP,T
87	Le Sueur	1C-1	Corporation Ced-Or	Corporation Ced-Or	Au	G
88	Le Sueur	1C-1	Inmet/Expl. minière du Nord/ SOQUEM	Lac Shortt (1123)	Au	S(12:1920),T,PP,Mag
89	Le Tac	1C-1	SOQUEM/Expl. minière du Nord	Le Tac (4041)	Au,Cu,Zn	S(22:2601),PP
90	Louvicourt	1C-5	Ressources Aur	BonneFond	Au	S(5:4875),G(ro)
91	Louvicourt	1C-5	Ressources Aur/Novicourt	Louvex	Au,Cu,Zn	G
92	Louvicourt	1C-5	Ressources Aur	Courageous	Au,Cu,Zn	Gc(ro),T,G
93	Louvicourt	1C-5	Mines Aurizon	Beacon	Au	S(28:4000),Gc(ro)
132	Louvicourt	1C-5	Mines McWatters	Sigma II	Au	S(12:491),PP
130	Lozeau	1C-3	Expl. Minière du Nord	Lozeau	Au,Zn	S(? :1008)
131	Lozeau	1C-3	Ressources Aurbec	Lozeau	Au,Cu,Zn	Gc(ro)
94	Malartic	1C-5	Azimuth/Ressources Breakwater	Malartic	Au	G,Pr,S(? :1200)
95	Malartic	1C-5	Mines McWatters	East-Amphi	Au	S, étude de faisabilité
96	Malartic/Cadillac	1C-5	Battle Mountain Canada	Malartic	Au	Mag,PP,Gc(s)
97	Masères	1C-1	Overburden Drilling Management	Delafond	Au,Cu,Zn	S
98	Massicotte/La Peltre	1C-3	Billiton Métaux Canada	B01	Au	S(4:874),PP,Pr
99	Massicotte/Manthet	1C-3	Ressources minières Radisson	Lac Gignac	Au	S(15:3471),Mag,PP

Tableau 1C-1 - (continued)

N°	CANTONS	FIG.	INTERVENANTS	PROJETS	SUBS.	TRAVAUX ⁽¹⁾
100	McKenzie	1C-1	SOQUEM	McKenzie (1186)	Au,Cu,Zn	Gp,T
101	McKenzie	1C-1	SOQUEM	Brosman (1230)	Au,Cu	S(7P879),PP,Mag
102	Montbray/La Peltre	1C-4	Mines Altavista	Kanasuta	Au	Mag,PP
103	Montbray	1C-4	Mines Agnico-Eagle	Montbray	Au	S(? :4869),Gc(t)
104	Montgolfier/Aloigny	1C-3	SOQUEM	M.A.D.	Au	Mag,Gc(t)
105	Noyelles	1C-1	Syndicat Berthiaume	Noyelles	Au	S(3:344)
106	Pascalis	1C-5	Mines Aurizon	Perron	Au	G
107	Perron/Rousseau	1C-1	Ressources Coleraine	Normétal	Au,Cu,Zn	G,Pr,T
108	Perron	1C-1	Ressources Coleraine	Perron	Au,Cu,Zn	S(13:2163),Gc(ro)
109	Pershing	1C-5	Exploration Malartic-Sud	Croinor	Au	G,S(? :1800)
110	Pershing	1C-5	Y.Lemieux	Busmac	Au	T,Gc(ro)
111	Privat	1C-1	P. Létourneur	PL298	Au,Cu,Zn	Mag
112	Privat/Launay/Manneville	1C-1	Exploration Boréale	Privat	Au	S(3:401),PP
113	Rohault/La Dauversière	1C-1	Ressources Meston	Mine Joe Mann	Au	S(488:30000)
114	Rouyn	1C-4	Ressources Yorbeau	Astoria	Au	Gc(ro),G,T
115	Rouyn	1C-4	Ressources Dianor	Adanac	Au	S(9:680),G,Gc(ro)
116	Rouyn	1C-4	Mines McWatters	McWatters	Au	T,G,Gc(ro)
116	Rouyn/Dufresnoy	1C-4	Cambior	Bloc Dufault	Au	PP
117	Roy	1C-1	SOQUEM/Ressources d'Arianne	Valiquette (1114)	Au	S(2:313),PP,T,Gc(ro)
118	Scott	1C-1	SOQUEM	Scott (1176)	Au,Cu,Zn	S(1:123)
119	Urban	1C-1	Inmet/Alto Minerals/ Noront Resources	Windfall Lake	Au	S(11:3500),Gp, TEM,TBF
120	Urban	1C-1	Ress.Murgor/Freewest Res./ Inmet	Windfall	Au	S
121	Urban/Barry	1C-1	Ressources Orient	Urban/Barry	Au	S(6:1396)
122	Urban/Barry	1C-1	Expl. Teck/Ress. Murgor/ Freewest Res.	Murgor	Au	S(9:2504)
123	Urban	1C-1	Inmet/Alto Minerals	Alto Alcane	Au	G
124	Valrennes	1C-3	Azimuth/Mines Agnico-Eagle	Joutel	Au,Cu,Zn	Pr,S
125	Vassan/Dubuisson	1C-5	Mines Western Quebec	Wesdôme	Au	S(93:35953), G:,Gc(ro)
126	Vauquelin	1C-5	Corporation Wabak-Pimadizi	Lac Simon	Au,Cu,Zn	G
127	Verneuil	1C-1	SOQUEM/Normabec	Verneuil	Au	S(4:852),Pr
128	Veza/Douay	1C-3	Mines Agnico-Eagle	District Veza	Au	S(5:3890),Gp
129	Veza/Douay	1C-3	SOQUEM/Jonpol/Perrex/ Bradshaw	Jonpol (1146)	Au	Mag

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DEM Levé électromagnétique type «pulse» en forage

E Échantillonnage

EF Étude de faisabilité et ou de marché

EM levé électromagnétique

ET Étude d'évaluation technique

Ev Échantillonnage en vrac

G Levé géologique

G Levé géochimique non définie

Gc(h) Levé géochimique d'humus

Gc(l) Levé géochimique de fond de lac

Gc(ro) Levé géochimique de roches

Gc(ru) Levé géochimique de ruisseaux

Gc(s) Levé géochimique de sols

Gc(t) Levé géochimique de till

Gp Levé géophysique non définie

GpA Levé géophysique aérien

Mag Levé magnétométrique

DEM Levé électromagnétique type «pulse»

PP Levé de polarisation provoqué

Pr Prospection

S(nb:m) Sondage au diamant (nombre : mètre total)

Sci Sondage de circulation inversée

T Excavation de tranchée et décapage

TBF Levé électromagnétique basse fréquence

TM Test métallurgique

* Travaux d'exploration réalisés au chantier

gras Projet à l'étape de la mise en valeur

□ Projet subventionné par le MRN

Tableau 1C-2 – Exploration projects for polymetallic deposits in the Abitibi and Pontiac Subprovinces in 1998.

N°	CANTONS	FIG.	SNRC	INTERVENANTS	PROJETS	SUBS.	TRAVAUX ⁽¹⁾
P1	Bapst	1C-3	32E/15	Métaux Billiton Canada	B-28	Cu,Zn,Au	S(5:1003), PP, PEM, Gc(ro)
P2	Bapst, Fénélon	1C-3	32E/15	Métaux Billiton Canada	B-19	Cu,Zn	PP
P3	Bapst, St-Hélène	1C-3	32E/16	Métaux Billiton Canada	B-29	Zn,Cu	S(1:334), PP, PEM, Gc(ro)
P4	Barraute	1C-2	32C/12	Mines Abcourt	Abcourt-Barvue	Zn,Ag	S(? :2100)
P5	Barraute, Fiedmont	1C-2	32C/05	Mines Abcourt	Vendôme	Zn,Ag,Au,Cu	S(9:1500)
P6	Beauchastel	1C-4	32D/03	SOQUEM Inc./ Ress. Minière Normabec	Lac Arnoux (VMS)	Cu,Ni,Au	PP
P7	Beschefer	1C-3	32E/10	Métaux Billiton Canada/ Alliance Corp.	Bonhomme	Cu,Zn,Au	S(14:4742), PP, Gp, Gc(ro), PEM
P8	Bourlamaque	1C-5	32C/04	Orezone/Ressources Aur	Bourlamaque (VMS)	Cu,Zn,Au,Ag	S(5:2000)
P9	Brouillan	1C-3	32E/15	Métaux Billiton Canada	B-26	Cu,Zn,Au,Ag	S(12:5250), PEM
P10	Brouillan	1C-3	32E/14	Métaux Billiton Canada	Carheil	Zn,Cu	S(4:700), PP
P11	Brouillan, Carheil	1C-3	32E/14	Métaux Billiton Canada	P-500	Cu,Zn,Au,Ag	S(6:1569), PP, PEM
P12	Buteux	1C-2	32G/03	Noranda/Lamothe-Smith	Lac Fecteau	Cu,Zn	S(4:940)
P13	Carheil	1C-3	32E/14	Métaux Billiton Canada	B-10	Cu,Zn	S(1:656), PEM
P14	Carheil	1C-3	32E/14	Métaux Billiton Canada	D2	Cu,Zn	S(3:468), PP, PEM
P15	Carheil	1C-3	32E/14	Métaux Billiton Canada	B9	Cu,Zn	S(1:220)
P16	Casa-Berardi, Laberge	1C-3	32E/06	Mine Cancor/Inco	Gemini	Cu,Zn,Au,Ag	S(7:3184), PP, EM, TBF, Mag
P17	Cavelier	1C-3	32F/12	Amblin Resources/Globex	Cavalier	Cu,Zn	PP
P18	Dalet	1C-3	32E/01	Goldsat Mining	Dalet	Cu,Zn,Au	PP, Pr, Gc(ro), Gc(s)
P19	Daniel	1C-3	32F/13	Goldsat Mining	Daniel	Cu,Au,Zn	PP, Int. Sat.
P20	Daniel	1C-3	32F/12	Noranda	Daniel 1 (446)	Cu,Zn,Ag,Au	Pr
P21	Daniel	1C-3	32F/12 32F/13	Noranda/SDBJ	Daniel JV (415)	Zn,Cu,Ag,Au	S(? :3631), PEM
P22	Daniel, Cavalier, Desmazures	1C-3	32F/12	Noranda	Mclvor	Cu,Zn,Ag,Au	S(1:140)
P23	Denain	1C-2	31N/14	Moss	Denain	Cu,Zn,Au,Ag	Pr, T
P24	Desmazures, Cavalier	1C-3	32F/12	Noranda/ Phelps Dodge Corp.	Phelps Dodge 2	Zn,Cu,Ag,Au	S(1:267)
P25	Dufresnoy	1C-4	32D/06	Noranda	Mine Gallen	Cu,Zn,Au,Ag	S(3:2065), PEM, Gc(ro)
P26	Enjalran, Massicotte, Carheil	1C-3	33E/14	Métaux Billiton Canada	B-07	Cu,Zn	S(5:929), PP
P27	Fénélon	1C-3	32E/15	Métaux Billiton Canada	B-18	Cu,Zn	S(3:797), PP, PEM, Gc(ro)
P28	Fénélon, Subercase	1C-3	32E/16	Métaux Billiton Canada	B-30	Cu,Zn	PP
P29	Galinée	1C-3	32F/12	Noranda	Bracemac	Cu,Zn,Ag,Au	S(? :4334), PEM, Gc(ro)
P30	Galinée, Cavalier, Isle-Dieu	1C-3	32F/12	Noranda	Preussag (451)	Zn,Cu,Ag,Au	S(? :1257), PEM, Gc(ro)
P31	Grevet, Mountain	1C-2	32F/02	Cambior	Grevet	Cu, Zn	S(16:5154), PEM, Gp, Pr
P32	Isle-Dieu	1C-3	32F/13	Noranda	Bell Channel	Zn,Cu,Ag,Au	S(1:154), PEM, Gc(ro)
P33	Isle-Dieu	1C-3	32F/13	Noranda	Norita	Zn,Cu,Ag,Au	S(? :713), PEM, Gc(ro)
P34	Isle-Dieu, Lozeau	1C-3	32F/13	Noranda	Matagami Recon.	Vanadium	S(? :454)
P35	Joutel	1C-3	32E/09	Agnico-Eagle/Azimut	Joutel	Cu,Zn,Au,Ag	Compilation
P36	La Corne	1C-5	32C/05	AAA Exploremines	Rosi	Cu	S(5:1200)
P37	La Gauchetière	1C-3	32E/16	Noranda/South Africa Minerals	Caber	Cu,Zn,Ag	S(? :11156), PEM
P38	Landrienne	1C-2	32C/05	Corporation minière Inmet	Landôme	Cu,Zn,Au,Ag	Compilation
P39	La Peltre, Carheil	1C-3	32E/14	Métaux Billiton Canada	B-23	Cu,Zn	S(2:1100), PEM
P40	La Peltre, Carheil	1C-3	32E/14	Métaux Billiton Canada	SG4	Cu,Zn	S(1:201)
P41	La Reine	1C-2	32D/14	Ressources Cristal		Cu,Zn,Au,Ag	G
P42	Lemoine	1C-2	32G/16	SOQUEM/Corner Bay Minerals	Corner Bay	Cu,Zn	S(5:878), EM

Tableau 1C-2 - (continued)

N°	CANTONS	FIG.	SNRC	INTERVENANTS	PROJETS	SUBS.	TRAVAUX ⁽ⁿ⁾
P43	Lemoine, Rinfret	1C-2	32G/16	McKenzie B Resources/ SOQUEM	Lac Doré	Vanadium	Mag, EF
P44	Le Tac	1C-2	32F/08	SOQUEM/Exploration minière du Nord	Le Tac Ouest (VMS)	Zn,Au	S, PP, T
P45	Livaudière	1C-2	32F/14	Goldsat Mining	Livaudière	Cu,Zn,Au	PP, Int. Sat.
P46	Louvicourt	1C-5	32C/03	Ressources Aur/Novicourt	Louvex	Cu,Zn,Au,Ag	S(8:4189), Gc(ro), Gp
P47	Mazarin	1C-3	32E/01	Goldsat Mining	Mazarin	Cu,Zn,Au	Int. Sat.
P48	McKenzie	1C-2	32G/16	Ressources MSV	Copper Rand	Au,Cu,Zn	EFs, (? :23460), F
P49	Montbray	1C-4	32D/06	AAA Exploremines	Montbray	Cu, Zn	S(5:1200), G
P50	Opémisca	1C-2	32G/15	Sambosum/Ouje Bougoumou/ Eenuch	Opémisca	Cu,Zn,Au	Pr, PP
P51	Perron	1C-2	32D/14	Ressources Cristal	Duvan-Bornite	Cu,Zn,Au,Ag	T, EF
P52	Perron, Des Meloïzes, Rousseau	1C-2	32E/03	Ressources Minières Coleraine	Normétal (VMS)	Cu,Zn,Au,Ag	S
P53	Roy, Lemoine, McKenzie, Obalski	1C-2	32G/16	SOQUEM/Ressources Meston	Chibougama 1119	Au,Cu,Zn	PP
P54	Ste-Hélène, La Gauchetière	1C-3	32E/16	SOQUEM/Métaux Billiton Canada	Colline St-Hélène 1215	Cu,Zn,Au	S(2:674), PEM
P55	Ste-Hélène, Subercase	1C-3	32E/16	SOQUEM/Métaux Billiton Canada	Samson (1091-1)	Cu,Zn,Au	S(6:2058), PEM, Mag
P56	Urban	1C-2	32G/04	Noront Ressources/ Alto Minerals	Windfall Lake (VMS)	Cu,Zn	S
P57	Urban	1C-2	32G/04	Murgor/Freewest/Inmet	Windfall (volet VMS)	Cu,Zn,Au,Ag	S(6:1130), T, Gp
P58	Valrennes	1C-3	32E/09	Teck Explo./ G.L. Géosciences	QD-43	Cu,Zn,Ag,Au	S(1:165)
P59	Vassan	1C-5	32C/04	Noveder/Morissette/ Gauthier/O'Connor	Abitibi	Cu,Zn,Ag,Au	S(4:1362), PEM, DPEM
P60	Destor	1C-4	32D/10	Amblin Ressources/Globex	Lyndhurst	Cu,Zn,Au,Ag	S(6:5050), PEM, Gp
P61	Bousquet	1C-4	32D/08	Mines Agnico-Eagle	Mine La Ronde (VMS)	Cu,Zn,Au,Ag	S(? :9830)
P62	Brouillan	1C-3	32E/15	Métaux Billiton Canada	Mines Selbaie	Cu,Zn,Au,Ag	S
P63	Dufresnoy	1C-4	32D/07	Cambior	Mine Bouchard- Hébert	Cu,Zn,Au,Ag	S(8:4801), PEM, G, Gc(ro)
P64	Louvicourt	1C-5	32C/03	Ressources Aur/ Teck Explo./Novicourt	Mine Louvicourt	Cu,Zn,Au,Ag	S(23:13450), Gp, Gc(ro)
P65	Orvilliers	1C-3	32E/10	Kernow Resources	Orvilliers	Cu,Zn,Au,Ag	S(7:997)
P66	Joutel	1C-3	32E/08	Kernow Resources	Joutel	Cu,Zn,Au,Ag	PEM

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DPEM Levé électromagnétique type «pulsé»
 E Échantillonnage
 EF Étude de faisabilité et/ou de marché
 EM Levé électromagnétique
 ET Étude d'évaluation technique
 Ev Échantillonnage en vrac
 G Levé géologique
 Gc Levé géochimique non défini
 Gc(h) Levé géochimique d'humus
 Gc(l) Levé géochimique de fond de lac
 Gc(ro) Levé géochimique de roches
 Gc(ru) Levé géochimique de ruisseau
 Gc(s) Levé géochimique de sol
 Gc(t) Levé géochimique de till

Gp Levé géophysique non défini
 GpA Levé géophysique aérien
 Int. Sat. Interprétation d'images satellites
 Mag Levé magnétométrique
 PEM Levé électromagnétique type «pulsé»
 PP Levé de polarisation provoquée
 Pr Prospection
 S(nh:m) Sondage au diamant (nombre : mètre total)
 Sci Sondage de circulation inversée
 T Excavation de tranchée et décapage
 TBF Levé électromagnétique basse fréquence
 TM Test métallurgique

gras Projet à l'étape de la mise en valeur

□ Projet subventionné par le MRN

1D

The New Québec and Torngat orogens, the Rae and Ungava Trough Subprovinces

Serge Perreault

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The New Québec Orogen (Labrador Trough) and the Ungava Orogen (Ungava Trough) are located in northern Québec (Figures 1D-1, 1D-2a and 1D-2b). These two Paleoproterozoic orogenic belts are within the Churchill Province and border the Archean craton of the Superior Province to the east and to the north. The Rae Subprovince (Figure 1D-1) is located between the New Québec Orogen to the west and the Torngat Orogen to the east. It comprises Archean and Paleoproterozoic rocks. The New Québec Orogen, better known as the Labrador Trough is a folded and thrust belt of Paleoproterozoic volcano-sedimentary rocks, which extends NNW-SSE for nearly 360 km into New Québec. These rocks rest on the northeast limit of the Archean Superior Province and the main transport direction is to the southwest. The Ungava Orogen, also known as the Ungava Trough or the Cape Smith Belt, is located in the extreme northern part of the New Québec Peninsula. It is a belt of volcano-sedimentary rocks extending over 370 km in a WSW-ENE direction (Figure 1D-2a), bordered to the south by the Archean Superior Province.

In 1998, exploration investments in the Labrador Trough and in the Rae Subprovince were \$2.33 M (\$4.36 M in 1997) for 15 projects. Also for 1998, off-mine site exploration investments attained \$0.67 M (\$1.46 M in 1997) in the Ungava Trough. The **Société minière Raglan** (a wholly-owned **Falconbridge** subsidiary) started production at the Raglan site at the end of 1997. The company met its mining objectives in the last quarter of 1998. Géologie Québec undertook geological mapping of NTS 24 I in the Rae Subprovince. This geological survey follows the regional geochemical lake bottom sediment survey carried out in 1997 by Géologie Québec in partnership with **Mines and Exploration Noranda**, **Cambior**, **Falconbridge**, **Soquem** and **Virginia Gold Mines**.

The New Québec Orogen, the Rae Subprovince and the Torngat Orogen

In partnership with **Virginia Gold Mines**, **Osisko Exploration** (2; Figure 1D-1) undertook a new exploration campaign in the extreme northern part of the New Québec orogenic belt. The property includes a mafic to ultramafic complex stretching over nearly 16 km. **Osisko** found about ten mineralized showings of disseminated to massive sulphides. Some of these mineralized zones, located at the base of peridotite horizons in the Qarqasiaq and Tasikutaak units are up to 100 metres long. Spot samples graded up to 6.50 % Ni and 0.34 % Co. The mean values published by the company are: 3.60 % to 6.25 % Ni, 0.09 % to 0.22 % Cu and 0.18 % to 0.33 % Co for 3 massive sulphide zones and 0.53 % to 1.18 % Ni, 0.14 % to 0.40 % Cu and 0.03 % to 0.07 % Co for 3 disseminated sulphide zones associated with the Qarqasiaq unit. The company also published values of 0.36 % to 1.11 % Ni, 0.28 % to 0.95 % Cu and 0.08 % to 0.18 % Co for 5 massive sulphide zones and 0.28 % to

0.54 % Ni, 0.22 % to 0.36 % Cu and 0.03 % to 0.04 % Co for the disseminated zones of the Tasikutaak unit.

In the Rae, **Falconbridge** (10; Figure 1D-1) and the consortium of **Cambior**, **Soquem** and **Virginia Gold Mines** (12, 13, 14, 15; Figure 1D-1) have started new geological reconnaissance campaigns east of Georges River. These companies are searching for Cu-Ni-Co-PGE deposits associated with the ultramafic rocks of the Lake Harbour Group.

Mines and Exploration Noranda (1, 3, 4, 5, 6, 11; Figure 1D-1) undertook exploration work on the exploration permits acquired following the geochemical regional survey of lake bottom sediments of the Far-North lakes. Work carried out included prospecting, geological mapping and soil geochemical surveys in the carbonate/marble sedimentary sequences of the Labrador Trough and in the carbonate and paragneissic units of the Lake Harbour Group. The desired substances are base metals (Zn-Cu) in SEDEX-type environments and massive sulphides of volcanic origin (VMS). In the Roberts Lake sector, Noranda returned values of 0.6 % Cu and 0.9 % Zn. In the Lake Harbour Group, Noranda found disseminated sphalerite in marble units. No economic grades were reported.

Inmet Mining Corp. (1; Figure 1D-1) in partnership with **Denison Mines** and **Virginia Gold Mines** continued the exploration campaign of the Sagar project, which **Virginia Gold Mines** had started at the end of the 1980s. The uranium- and gold-bearing mineralization was discovered in fields of altered and angular blocks, some of which graded up to 106 g/t Au and 1.31 % U. **Virginia Gold Mines** reported 75 blocks grading a mean of 56 g/t Au and 1.3 % U. These blocks were found in a horst limited by Mistamisk Lake and Romanet Lake; the horst is also known for Au-U and U-Cu mineralizations associated with a syntectonic sodic metasomatism. In 1998, **Inmet** drilled 6094 metres and carried out mapping to find the source of these blocks. According to **Inmet** geologists, mineralization takes two forms: 1) stratiform oxidoreduction fronts and 2) vein mineralizations associated with major structures. One drill hole returned values of 2.3 g/t Au and 0.1 % U over 1.8 m.

Ungava Trough

With investments of nearly \$500 M, **Société minière Raglan du Québec** (16; Figure 1D-2a and 1D-2b), a wholly-owned subsidiary of **Falconbridge**, reached its production objectives at the Raglan nickel and copper mine during the third quarter of 1998. When the development of the Raglan mine is completed, **Falconbridge** will have increased its nickel production by nearly 50 %. The company projects mining for 25 years with an annual production of 21 000 tonnes of nickel concentrate, 5000 tonnes of copper concentrate and 200 tonnes of cobalt concentrate. Production costs are estimated at \$1.50/lb Ni. **Société minière Raglan du Québec** operates an underground mine and an open pit and mines massive sulphide lenses located at the

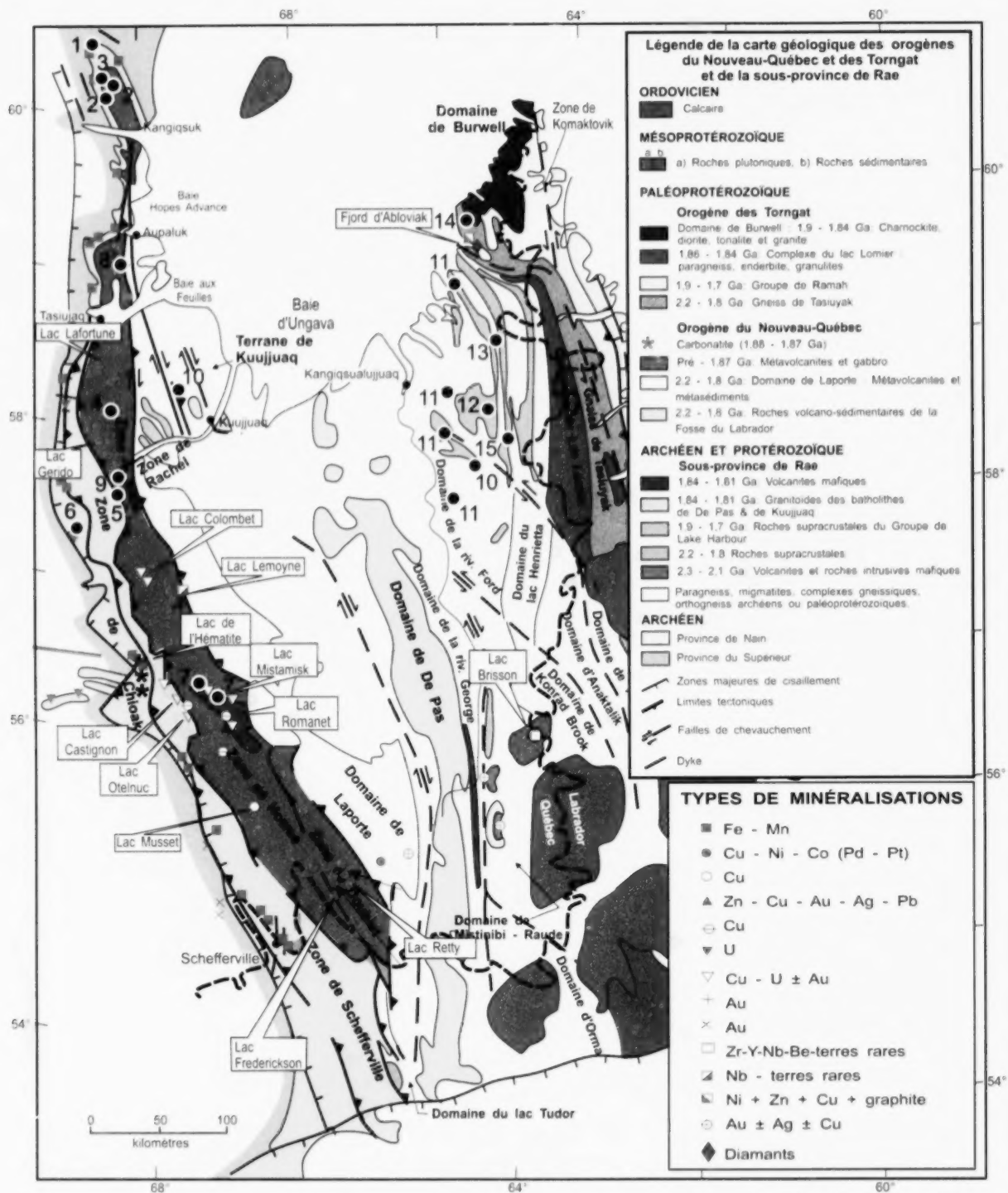
base of ultramafic flows of the Chukotat Group. The reserves of the Raglan deposit (including Cross Lake, Katinik and Donaldson deposits) are estimated at 22 Mt with a mean grade of 3.12 % Ni and 0.87 % Cu. Through the 1998 drilling campaign, the company added 1.8 Mt to the Raglan mineral resources with the discovery of a new mineralized lens in the western part of the property.

Dumont Nickel (19, 20; Figure 1D-2a) undertook an exploration campaign within the Lac Raglan and Shoot Out projects. The company is searching for Ni-Cu-PGE deposits associated with peridotite horizons found at the interface between the Chukotat and the Povungnituk units, and within the Povungnituk unit. With the work carried out in 1998 on the Lac Raglan project, a gold showing (Laila showing) was found in a shear zone cutting across the peridotite. A new Ni-Cu-PGE showing (Ladyfinger showing) was found on the Shoot Out project.

In partnership with **Boreal Exploration** and **Falconbridge, Soquem** discovered gold-bearing showings on the Gerfault property. The company found VMS-type mineralizations associated with chert horizons in the Parent Group volcanics. Gold-bearing showings (3.08 g/t Au over 10.5 m and several showing between 1 and 2 g/t Au) were found in silicified structural zones with pyrite and arsenopyrite. Base metal showings (up to 0.87 % Cu and 0.40 % Zn) were also found during this field survey campaign.

Outlook

In the New Québec and in the Ungava orogenic belts, the 1999 off-minesite exploration expenditures should remain the same as in 1998. The expenditures will however be lower in the Rae Subprovince. The main activities will focus on the search for magmatic Ni-Cu-PGE, VMS- and SEDEX-types base metal deposits.



Modifiée de Wardle et al., 1990a

FIGURE 1D-1 – Location of mining exploration projects in the New Quebec and Torngat orogenic belts, as well as in the Rae Subprovince, in 1998.

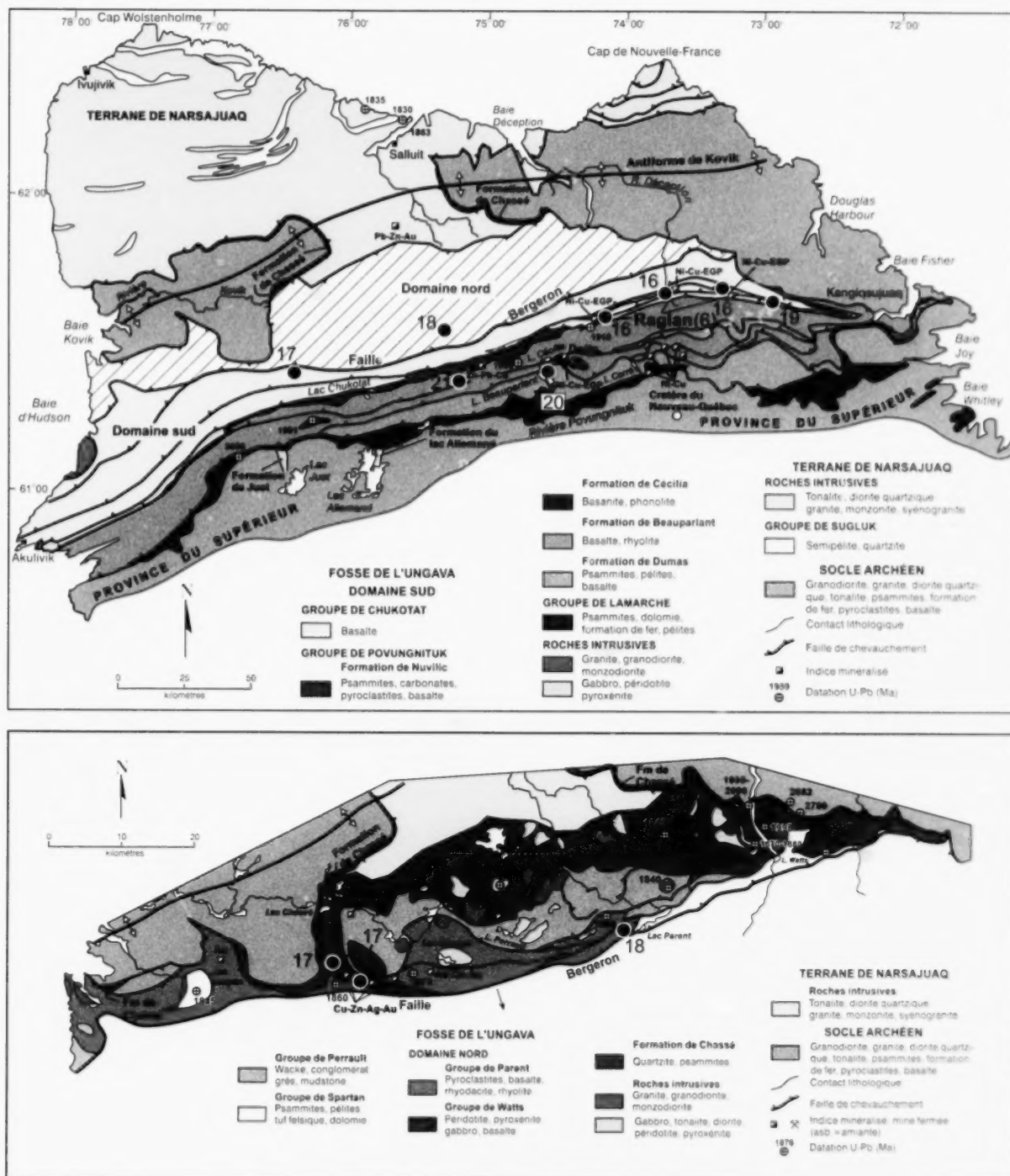


TABLEAU 1D-1 – Exploration projects carried out in the New Québec orogen, the Torngat orogen, the Rae Subprovince, and the Ungava Trough in 1998.

N°	CANTON	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽¹⁾
Orogène du Nouveau-Québec (voir figure 2D-1 pour la localisation des projets)						
1		25D/07, 25D/09, 25D/10	Mines et Exploration Noranda	Colline Pingaluit	Zn, Cu	Pr, Gc(ro), Gc(ru), Gc(s)
2		25D/01	Osisko Exploration	Payne Bay	Ni, Cu, Co, EGP	G, Pr
3		25D/08	Mines et Exploration Noranda	Lac Roberts	Zn, Cu	Pr, Gc(ro), Gc(ru), Gc(s)
4		24K/03	Mines et Exploration Noranda	Thévenet	Zn, Cu	Pr, Gc(ro), Gc(ru), Gc(s)
5		24F/05	Mines et Exploration Noranda	Le Mercier	Zn, Cu	Pr, Gc(ro), Gc(ru), Gc(s)
6		24F/11	Mines et Exploration Noranda	Forbes	Zn, Cu	Pr, Gc(ro), Gc(ru), Gc(s)
7		24B/05, 24C/08	Corporation minière Inmet/ Denison Mines / Mines d'Or Virginia	SAGAR	Au, U, Cu	Pr, G, Gp, Gc(ro) S(? :6094)
8		24F/11	Kennecott Canada Exploration	Kan	Cu, Zn	Envir
9		24K/13, 24N/03	Troymin Resources/ International Butec	Hawk Ridge / Hopes Advance	Cu, Ni, Co	ET
Province de Rae (voir figure D-1 pour la localisation des projets)						
10		24K/07, 24H/15, 24H/16, 24I/02	Falconbridge	Grand Nord	Ni, Cu	G, Pr
11		24H, 24I, 24P	Mines et Exploration Noranda	Secteur du Rae	Zn, Cu	G, Pr, Gc(ru), Gc(ro), Gc(s)
12		24I/07	Cambior, Soquem, Mines d'Or Virginia	Koroc	Ni, Cu, Co	G, Pr, Gpa
13		24I/10, 24I/14, 24I/15	Cambior, Soquem, Mines d'Or Virginia	Baudoncourt	Ni, Cu, Co	G, Pr, Gpa
14		24P/11, 24P/14	Cambior, Soquem, Mines d'Or Virginia	Le Droit	Ni, Cu, Co	G, Pr, Gpa
15		24I/01, 24I/02	Cambior, Soquem, Mines d'Or Virginia	Tornick	Ni, Cu, Co	G, Pr, Gpa
Fosse de l'Ungava (voir figure D-2 a) et b) pour la localisation des projets)						
16		35G/08, 35H11, 35H/12	Falconbridge	Raglan*	Ni, Cu, EGP	G, GpS, EM, Mag, DEPM, S(? :63000 m)
17		35F/07, 35F/08, 35F/09, 35F/10	Falconbridge	Lac Hubert	Ni, Cu, Au	Pr, G, Envir
18		35G/11	Soquem, Boréale Exploration, Falconbridge	Gerfault	Au, Cu, Zn	G, Pr, Gpa
19		35H/11	Dumont Nickel	Lac Raglan	Ni, Cu	G, Pr, Mag, EM
20		35G/07, 35G/08	Dumont Nickel	Shoot Out	Ni, Cu	G, Pr, Gc(s), Mag, EM
21		35G/06	Maverick Investment Corporation	PEM 1083	Ni, Cu	G

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DEPM Levé électromagnétique
E Échantillonnage
ET Étude de faisabilité et ou de marché
EM Levé électromagnétique
ET Étude d'évaluation technique
Ev Échantillonnage en vrac
G Levé géologique
Gc Levé géochimique non défini
Gc(h) Levé géochimique d'humus
Gc(l) Levé géochimique de fond de lac
Gc(ro) Levé géochimique de roches
Gc(ru) Levé géochimique de ruisseaux
Gc(s) Levé géochimique de sols
Gc(t) Levé géochimique de till

Gp Levé géophysique non défini
GpA Levé géophysique aérien
Mag Levé magnétométrique
PEM Levé électromagnétique de type «pulse»
PP Levé de polarisation provoquée
Pr Prospection
S(nb:m) Sondage au diamant (nombre: mètre total)
Sci Sondage de circulation inversée
T Excavation de tranchée et décapage
TBF Levé électromagnétique basse fréquence
TM Test métallurgique
* Travaux d'exploration réalisés au chantier
gras Projet à l'étape de mise en valeur
Envir Travaux de restauration environnemental
□ Projet subventionné par le MRN

1E

The Grenville Province

Roch Gaudreau
Serge Perreault

SEDEX-, VMS-, Skarn- and Epigenetic Gold-Type Deposits	32
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1
E

In 1998, \$4.75 M were spent on off-minesite exploration work in the Grenville Province, compared to \$13.94 M in 1997. This very severe decrease in investments was due to low base and precious metals prices and to difficulties faced by junior mining companies in financing their exploration campaigns. However, in spite of all this, exploration of several mineralization types continued in the Grenville in 1998.

SEDEX-, VMS-, SKARN- AND EPIGENETIC GOLD-TYPE DEPOSITS

In the Mont-Laurier-Maniwaki region (32, 33; Figure 1E-1), **Mines and Exploration Noranda**, in partnership with **Soquem**, searched for zinc-bearing mineralizations, of SEDEX type, in supracrustal sequences similar to the one of Balmat region in New York state. The work carried out in 1998 focussed mainly on verifying the extension of the mineralized zones previously intersected by drilling on the Bouchette and Aumond properties. **Soquem** and **Mines and Exploration Noranda** completed the reconnaissance work in the Parent region in order to evaluate the potential for polymetallic volcanogenic mineralizations in quartzofeldspathic and mafic gneisses (38; Figure 1E-1).

In 1998, **Louvicoourt Gold Mines** and **Fonteneau Resources** undertook a vast geophysical and geochemical exploration campaign in the Maniwaki region in order to evaluate the potential for zinc-bearing mineralizations in marble sequences and polymetallic skarns zones around the late intrusions (34; Figure 1E-1).

Ressources Appalaches and **Soquem** reactivated the Dussault project (40; Figure 1E-1), a property characterized by a major exhalative system extending over several kilometres. Work carried out in 1998 brought to light new alteration zones and sulphide lenses enriched in zinc and copper.

In the La Tuque region, **Osisko Exploration** discovered a polymetallic stockwork over 10 m thick in a paragneiss band on its Saint-Maurice property. A 3.8 m channel sample graded 0.7 % Cu, 1.1 % Zn, 9.4 g/t Ag and 0.6 g/t Au (41; Figure 1E-1).

The **Fonds régional d'exploration minière de la Côte-Nord (FREM)** and prospectors **G. Gallant** and **J.-G. Gallant** (86; Figure 1E-1) discovered a copper-bearing showing (1.2 % Cu) in a vein at the contact between a rhyolite and an arenite of the Wakeham Group. The **FREM** and prospectors **Claude** and **Robert Ouellet** (85; Figure 1E-1) found pyrrhotite, chalcopyrite and arsenopyrite mineralization associated with an amphibolite in the Wakeham Group. The mineralization occurs in a stockwork and in massive sulphide veins. Trench samples grade from 1 to 4 % Cu.

In 1998, **Norcal Resources**, **Gold Giant Minerals** and **Castel Rock Exploration** continued their campaign in the Gouin Reservoir area located at the eastern limit of the Grenville Front (43, 44; Figure 1E-1). A 2000-m drilling

campaign intersected a series of massive to semi-massive sulphide lenses; an erratic block graded 270 g/t Au in a brecciated andesite.

NICKEL-COPPER-COBALT MINERALIZATIONS

Virginia Gold Mines continued investigating a vast troctolitic complex covering over 1000 km² in the Chutes-des-Passes area (22; Figure 1E-1). A drilling campaign of nearly 2000 m intersected several mineralized lenses ranging from a few centimetres to a metre thick within layered sequences. The best drill hole intersections on the Paul and Manouane grids graded 1.28 % Ni, 0.69 % Cu and 0.09 % Co over 0.33 m, and 1.18 % Ni and 0.1 % Co over 1.66 m.

Osisko Exploration signed an agreement with **Troymin Resources** on the Saint-Maurice property in the La Tuque region (41; Figure 1E-1). New massive to semi-massive sulphide showings discovered on the property graded 0.5 % to 4.8 % Ni, 0.1 % to 0.5 % Cu and 0.05 % to 0.18 % Co in peridotite and pyroxenite intrusions.

The Lac Volant Cu-Ni-Co showing (2.3 % Cu, 2 % Ni, and 0.12 % Co on channel samplings over nearly 6 metres) is associated with a non-deformed differentiated gabbro-norite dyke (1350 Ma) within the Matamec complex. **Soquem** (71; Figure 2E-1) carried out some verification work in 1998, with drilling the gabbro-norite dyke near Volant Lake. No significant mineralizations were found in these drill cores.

Soquem (75; Figure 2E-1), in partnership with **Virginia Gold Mines**, **Société minière Vior**, **Exploration Azimut** and **Kennecott Canada**, continued the exploration work started in 1997 on the AB-7 project by the **Virginia Gold Mines**, **Société minière Vior** and **Exploration Azimut** consortium. Mineralization is in a 200-m thick leuconorite dyke with magnetite and disseminated sulphides. The mineralization occurs as disseminated (1 to 3 % sulphides), in stringers (3 to 15 % sulphides) or massive to semi-massive lenses at the lower contact of the dyke. In 1998, **Soquem** obtained values of 0.11 % Cu and 0.12 % Ni over 6 metres.

Ressources Fancamp (68; Figure 1E-1) continued its exploration campaign in the Méchant Lake area within the Matamec ecological reserve project. In 1997, **Kennecott Canada** had intersected low-grade Cu-Ni-Co mineralizations associated with a gabbro complex and in mineralized paragneiss. In 1998, **Ressources Fancamp's** surface samples returned 3 % Cu, 1.3 % Ni 0.10 % Co and abnormal values up to 0.8 g/t Au (800 ppb).

Matamec Explorations, in partnership with **Géonova Explorations** (78; Figure 2E-1), continued work on the Manitou Est property, in the Manitou Lake area. Impressive grades were obtained: 0.13 to 5.11 % Cu, 0.13 to 0.83 % Ni 0.01 to 0.17 % Co, 1 to 6.2 g/t Ag and up to 390 ppb Au. In 1998, the best weighting on the Arnaud showing graded 0.68 % Ni and 0.34 % Cu over 2.37 m with 0.93 % Ni,

0.20 % Cu and 0.11 % Co over 1.5 metres. Mineralization is found in a 20-m thick and 400 m long pyroxenite horizon located in the Havre-Saint-Pierre anorthosite suite.

In the Manicouagan region, the **FREM** and **Outokumpu Mines** (53; Figure 2E-1) began a new project in 1998, the La Blache project, to search for Cu-Ni-Co showings associated with gabbro, anorthosite and ultramafic rocks. The duo carried out airborne geophysical surveys, prospecting, mapping and sampling and discovered a metre-size nickel showing grading up to 1.2 % Ni. Prospectors **Claude** and **Robert Ouellet** (70; Figure 2E-1), in partnership with the **FREM**, discovered a Ni-Cu-Co showing associated with a differentiated mafic dyke. The massive (2 m x 3 m) pyrrhotite and chalcopyrite mineralization is located at the interface between the surrounding paragneiss and the differentiated gabbro-pyroxenite dyke. The best values graded 1.4 % Ni, 0.66 % Cu, 0.16 % Co and 600 ppb palladium.

COPPER-IRON-RARE EARTH MINERALIZATION

Between 1996 and 1997, **Soquem** continued detailed mapping, carried out geochemical surveys and drilled on its Nipississ (Kwiyjybo) project. The best grades obtained were: 1.8 % Cu and 1 % rare earths over 9.4 m in a channel sample, 1.1 % Cu over 6.4 m, 0.6 % Cu and 1.5 % rare earths over 3.5 m and 0.3 % Cu over 62 metres. The mineralization is similar to the Australian Olympic Dam

and the Swedish Kiruna types. In 1998, the best grades obtained by **Soquem** and **Matamec Explorations** (81; Figure 2E-1) were 0.46 % Cu over 8.1 m, 0.5 % Cu over 21 m and 0.55 % Cu over 10.5 m in 3 drill holes.

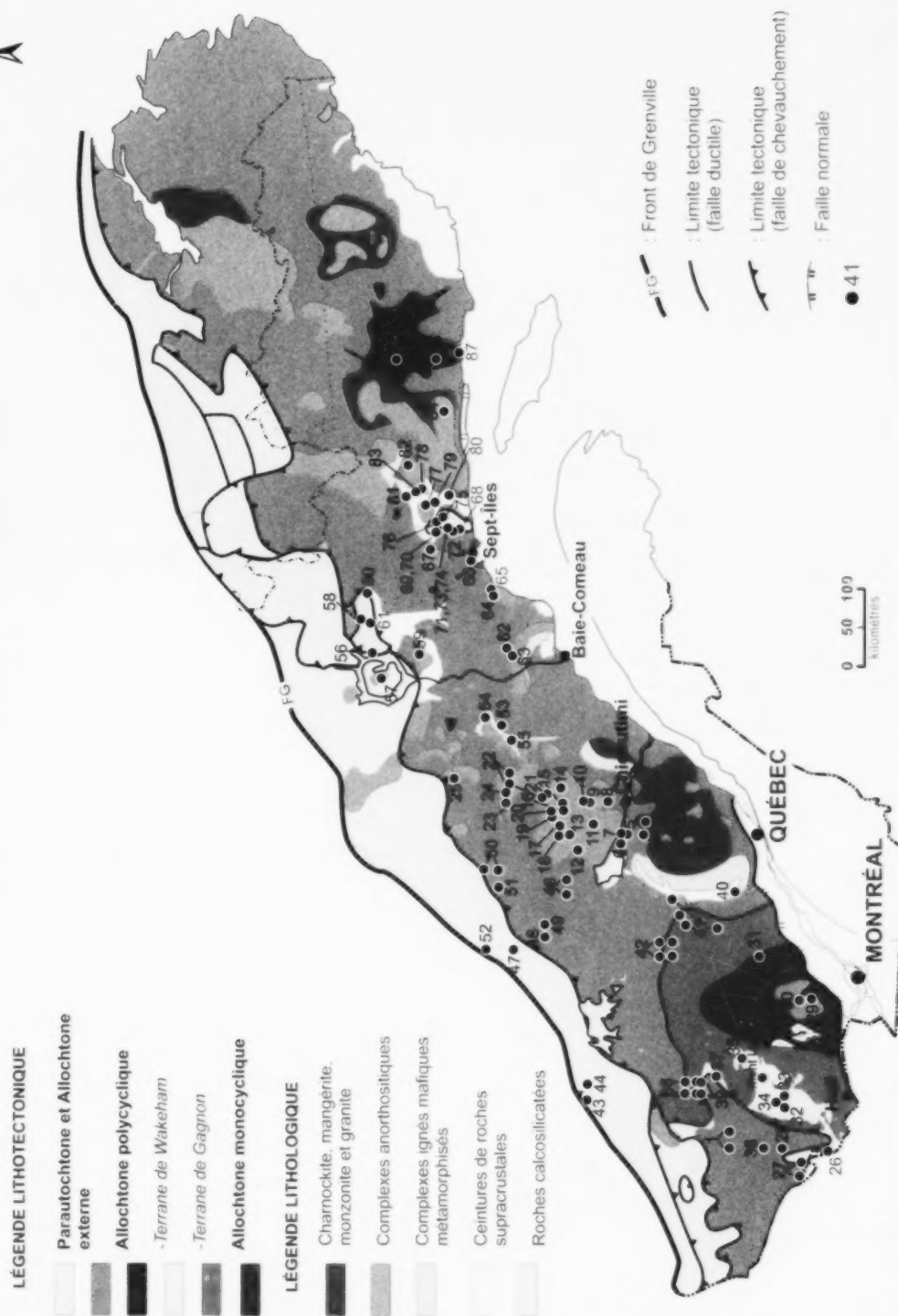
VANADIUM-BEARING TITANOMAGNETITE DEPOSITS

In the Chicoutimi region, **Osisko Exploration** reached an agreement with **North American Titanium** concerning the Buttercup property (10; Figure 1E-1). The area is mainly bedded gabbroic anorthosite with layers of vanadium-rich titanomagnetite cumulates. In 1998, a series of angular, massive, titanomagnetite erratic blocks were found by prospecting along the regional lineament. Four blocks graded between 0.60 % and 0.66 % V_2O_5 .

Outlook

Low base and precious metals prices in the last quarter of 1998, combined with difficult financing for junior mining companies, lead to believe that total exploration expenditures will slightly decrease in the Grenville Province in 1999. Following heavy focus on Ni-Cu-Co exploration work in 1997, we foresee more diversified exploration in 1999, with possible renewed activity in the search for industrial metals.

Province géologique de GRENVILLE



S. Percival et S. Gauthier '98 (d'après MM 94.01)

FIGURE 1F-1 Exploration project sites in the Grenville Province in 1998.

TABLEAU 1E-1 – Exploration projects carried out in the Grenville Province in 1998.

N°	CANTON	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽ⁿ⁾
1	Hainault, Kondiaronk, Champagne, Orléans	31K/15, 16	André Gauthier	Vulcain 3	Ni-Cu	Pr, E, G, Gp
2	—	22 ouest, 31nord, 32 sud-est	Soquem	Autonomes Grenville ouest		Cu-Ni-Zn-Au Pr, E, G
3	Cimon	22D/03	Roger Ouellet	22D/03	Ni-Cu	E, Pr, Gc(ro)
4	Chicoutimi	22D/03-04	Jules Doré	Recon	Ni-Cu-Co	Pr, E, G
5	Plessis, Laugue	22D/03-06	Falconbridge	Kénogamie	Ni-Cu	Pr, G
6	Labarre	22D/05	Lionel Lefèvre	Hébertville	Ni-Cu-Co	Pr, E, G, T
7	Kénogami	22D/06	Robert Gagnon	Groupe Jamar	Ni-Cu-Co	Pr, E, G
8	—	22D/10	Matamec Explo., Valin Explo.	Marié	Ni-Cu	GpA(Mag-EM), TBF, Gc(ru,s,l), Pr
9	Chardon, Garreau	22D/10-15	Jimmy Desgagnés	90-001	V-Ti-P	Pr, E, G
10	Garreau, Dubuc, Chastelin, Tremblay	22D/10-15	Osisko Explo., North American Titanium	Buttercup	V. Fer-titane	Pr, E
11	Simard	22D/11	Corp. Teck/Cambior	BM 663 et 706	Nb	S
12	Constantin, Milot, Dalmas	22D/13	Res. Arianne	Milot	Ni-Cu	G, Pr, E
13	Rouleau	22D/14	Gérard Girard	Notre-Dame du Rosaire	Ni-Cu-Co	Pr, E
14	—	22E/02	Marcel St-Laurent	Lac Mirepoix	Cu-Zn	Pr, E, G
15	—	22E/03	Gaetan Tremblay	Rivière Jolie	Cu-Au	Pr, E, G
16	—	22E/03	Léopold Tremblay	Poisson Blanc	Ni-Cu-Co	Pr, E, G, T
17	Constantin, St-Onge	22E/03-04	Gaston Savard	Samen-Constantin	Ni-Cu, Zn	Pr, E
18	Tanguay	22E/04	Lionel Lefèvre	Lac des Cyprès	Ni-Cu-Co	Pr, E, G
19	Petit, Faraux	22E/04-06	Yves Audet	Prospect 3	Ni-Cu-Co	Pr, E
20	Pinsonneault	22E/06	Jean-Marie Simard	JMS	Ni-Cu-Co	Pr, E
21	De Chardon	22E/10	Marcel St-Laurent	Lac Drapeau	Ni-Cu-Co	Pr, E, G, T
22	—	22E/10-15-16	Mines d'Or Virginia, Fonds Minier Saguenay-Lac-St-Jean	Chute-des-Passes	Ni-Cu-Co	Mag, HEM, G, Pr, E, Gc(s), S(? :1998)
23	—	22E/14	Gaston Savard	Peri-Manuane	Ni-Cu-Co	Pr, E, G
24	Primeau, Tanguay	22E/14-15	Denis Dufour	Lac à l'île Blanche	Ni-Cu, Zn	Pr, E
25	De Pontbriand	22L/08	Jean-Jacques Boily	JAM 1998	Ni-Cu-Co	Pr, E, G
26	Grand-Calumet	31F/10	Golden Calumet Explo.	New Calumet	Zn-Pb-Au-Ag	Gp
27	Waltham	31F/14-15	Bernard Charron	Bordures d'anorthosite	Ni-Cu	Pr, E
28	Huddersfield	31F/15, 31K/02	Rémi Charbonneau	Hickey	Cu, U	Pr, E
29	Chertsey	31I/04	Luc Boulé	Morgan	Ni-Cu	T, Pr, E, Gc(ro)
30	Cartier	31I/05	Luc Boulé, Martin Berthiaume	Cartier	Ni-Cu	Pr, E, Gp(mag), G
31	Arcand, Aubry, Allard, Kayne, Desaulniers, Chapleau	31I/05-06-10 à 14	Phil Boudrias	Masticouche	Ni-Cu	Pr, E
32	Bouchette	31J/05	Mines et Explo. Noranda, Soquem	Gatineau-Bouchette	Zn-Ag	Gp(g), S(3:583)
33	Aumond	31J/05	Mines et Explo. Noranda, Soquem	Gatineau-Aumond	Zn-Ag	Pr, E, S(? :86)

TABLEAU 1E-1 - (continued)

N°	CANTON	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽¹⁾
34	Bouchette, Wright, Northfield, Dorion	31J/05	Louvicourt Gold Mines, Fonteneau Res.	Maniwaki	Zn	Pr, Gp(Mag-EM), Gc(s)
35	Viel	31J/10	Jean Viger	Higginson	Zn	Pr, E, T, Gc(s, ro), G
36	Brie	31K/07	Jean Marie Sempels	Gneiss rouillé	Au-Cu	Pr, Mag-TBF, E, G
37	Chopin	31O/03	Michel Belisle	Dieppe-Vastel	Cu	Pr, E
38	—	31O/05-06-11-12	Soquem, Mines et Explo. Noranda	Parent	Cu-Zn-Au	Pr, Gc(s), E, T
39	Pétain, Sévigny	31O/06-13	Explo. Vior, Mines d'Or Virginia	Parent-Clova	Cu	Pr, E, Gc
40	Pothier, Lapeyrère	31P/01	Res. Appalaches, Soquem	Dussault	Zn-Cu-Au	Mag-TBF, G, Pr, S(7:2100)
41	Charest, Tourouvre	31P/07-08-10	Osisko Explo., Troymin Res.	St-Maurice	Cu-Ni, Zn-Cu-Au-Ag	Pr, HEM, E, Gc(s)
42	Cadioux, Albani, Ingall, Rhéaume Dumoulin	31P/10-11-14-15	Bertrand Vigneault	Cantons multiples	Cu-Zn-Au	Pr, E
43	Vasson, Noiseux, Logan, Cheprier, Kalm	32B/05-12, 32C/08-09	Gold Giant Minerals, Norcal Res.	Norgiant	Cu-Zn-Pb, Au	Mag-EM, S(16:2500), Gc, G, Pr, T, E
44	Logan	32B/12	Gold Giant Minerals, Norcal Res., Castle Rock Explo.	Aurville	Cu-Zn, Au	Pr, G, E, T, Gc (s), Mag, PP, EM
45	—	32H	Soquem	Reconnaissance	Cu-Zn-Au, Ni-Co	Pr, Gc
46	Hudon	32H/01-02	Frances Tremblay	Hudon FRA-A	Cu-Zn	Pr, E, G
47	Aigremont	32H/05	Charles Henri Laflamme	Aigremont	Cu-Au	Pr, E, G
48	Deshotels	32H/06	Bernard Sénéchal	Beethoven 4	Ni-Cu-Co	Pr, E, G
49	Deshotels	32H/06	Bernard Sénéchal	Beethoven 5	Ni-Cu-Co	Pr, E, G
50	—	32H/09-16	Rémi Laprise	Grand lac Jourdain	Cu-Zn	Pr, E
51	Marsolet	32H/10	Roger Bélanger	Nord du lac	Cu-Zn	Pr, E, G
52	Mance	32H/12	Benoit Frigon	Lac Navette	Cu-Au	Pr, E
53	—	22F/13-14	FREM, Outokumpu Mines	Lac La Blache	Ni, Cu, Co, EGP	Pr, G, GpA, E
54	—	22K/03	Falconbridge Ltée	Outardes	Ni, Cu, Co, EGP	Pr, G, Mag, Gp
55	—	22F/13	AFCAN	Dissimieu	Fe, Ti, apatite	ET, EV
56	—	22N/08-09	Matamec Explorations	Guylaine	Ni, Cu, Co, EGP	Pr, G, Gc(s), T, TBF
57	—	22N/07	Amadeus Resources	Manicouagan	Ni, Cu, Co, EGP	GpA
58	Forgues	22O/12	Falconbridge Ltée	Forgues	Ni, Cu, Co, EGP	G, T, TBF, Mag, Gp
59	—	22K/16	Tiomin Resources, Soquem Inc.	Annic	ET	
60	—	22O/11	FREM, A. Gagnon	Montagne Blanche	Ni, Cu	Pr, E, T
61	—	22O/12	FREM, C. Ouellet, R. Ouellet	Lucie	Ni, Cu, Co, EGP	Pr, G, E, T
62	—	22F/16	FREM, Exploration Esbec	B-30	Ni, Cu	Pr, G, T
63	—	22F/16	Ressources Fancamp, Exploration Esbec	B-40	Ni, Cu	Pr, G, Gp, T, S
64	—	22G/14	C. Ouellet, R. Ouellet	CORO	Ni, Cu, Co	Pr, E, T
65	—	22G/14	Mines d'Or Virginia, Exploration Esbec	B-20	Ni, Cu, Co	Pr, G, E, T

TABLEAU 1E-1 - (continued)

N°	CANTON	SNRC	COMPAGNIE	PROJET	SUBS.	TRAVAUX ⁽¹⁾
66	Arnaud, Letellier	22J/02-07-08	Soquem Inc., Norsk Hydro	Sept-Îles	Fe, Ti, apatite	EF, TM
67	—	22J/16	Soquem Inc.	Tika	Ni, Cu, Zn	Pr, G, Gc(s), T
68	Moisie	22I/05	Ressources Fancamp	Méchant	Ni, Cu, Co	Pr, G, T, E
69	—	22I/13	FREM, Troymin Resources	Firth	Ni, Cu, Co, EGP	Pr, E, T
70	—	22I/13	FREM, R. Pelletier	Dal	Ni, Cu, Co	Pr, T, E
71	—	22I/12-13	Soquem Inc.	Lac Volant	Ni, Cu, Co	G, PEM, S(2:822)
72	—	22I/12	Falconbridge Ltée	Nipisso	Ni, Cu, Co	G, Pr
73	—	22I/12-13-14	Matamec Explorations	Ross	Ni, Cu	Pr, G, Mag, TBF, Gc(s), Gc(ru), ET, S(1:188)
74	—	22I/13	Ressources BRL	Le Bigot	Ni, Cu, Co	Pr, G
75	—	22I/13	Soquem Inc., Mines d'Or Virginia, Azimuth, Vior, Kennecott Canada	AB-7	Ni, Cu, Co	G, PEM, S(3:693)
76	—	22I/12-13	Matamec Explorations, Géonova Explorations	Manitou-Ouest	Ni, Cu, Co	Pr, G, Gc(ru)
77	—	22I/14	Soquem Inc.	Mont Tortue	Ni, Cu, Co	Pr, G, Mag, EM, S(1:200)
78	—	22I/14	Matamec Explorations	Manitou-Est	Ni, Cu, Co	Pr, G, T, Gc(s), S(1:229)
79	—	22I/12-14	Matamec Explorations	Tortue Est et Ouest	Ni, Cu, Co	Pr, G, Gc(ru)
80	—	22I/06-12	Matamec Explorations	Blocs 1, 2, 3	Ni, Cu, Co	Pr, G, Gc(ru)
81	—	22I/14, 22P/03	Soquem Inc., Matamec Explorations	Kwyjibo	Cu, terres rares	G, Gc(s), S(6:1582)
82	—	22P/01-02	FREM, M. Castilloux	Poisset	Ni, Cu, Co, EGP	Pr, G, E, T
83	—	22I/14	Vantex Oil, Gas & Minerals Ltd, Ress. Ste-Genevieve	Manitou	Ni, Cu, Co	GpA
84	Parker, Vigneault	12L/10-11-12	QIT Fer et Titane	Big Island Lac Allard	Fe, Ti	G, T
85	—	12L/10	FREM, C. Ouellet, R. Ouellet	Noroy	Cu, Zn, Au	Pr, G, T, E
86	—	12M/02	FREM, G. Gallant, J.G. Gallant	Fleury	Cu, Zn, Au	Pr, E
87	Natashquan, Duval	12K/04	Tiomin Resources	Natashquan	Fe, Ti, grenat, zircon	ET
88	—	22G, 22I, 22J, 12L, 22O, 22K, 22N	Soquem Inc.	Grenville-est	Cu, Ni, Zn, Au	Pr, G, Gp, Gc
89	—	22G, 22I, 22J, 12L, 22O, 22K, 22N	Falconbridge Ltée	Grenville	Ni, Cu, Co, EGP	Pr, G, Gp, Gc

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DPEM Levé électromagnétique

E Échantillonnage

EF Étude de faisabilité et ou de marche

EM Levé électromagnétique

ET Étude d'évaluation technique

Ev Échantillonnage en vrac

G Levé géologique

Gc Levé géochimique non défini

Gc(h) Levé géochimique d'humus

Gc(l) Levé géochimique de fond de lac

Gc(ro) Levé géochimique de roches

Gc(ru) Levé géochimique de ruisseaux

Gc(s) Levé géochimique de sols

Gc(t) Levé géochimique de till

Gp Levé géophysique non défini

GpA Levé géophysique aérien

Mag Levé magnétométrique

PEM Levé électromagnétique de type «pulsé»

PP Levé de polarisation provoquée

Pr Prospection

S(nb,m) Sondage au diamant (nombre : m total)

Sci Sondage de circulation inversée

T Excavation de tranchée et décapage

TBF Levé électromagnétique basse fréquence

TM Test métallurgique

* Travaux d'exploration réalisés au chantier

gras Projet à l'étape de mise en valeur

Envir Travaux de restauration environnemental

□ Projet subventionné par le MRN

1
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1F

The Saint-Lawrence platform and the Appalachians

Serge Lachance

Southwest region (Montreal–Chaudière–Appalaches)	40
Centre region (Lower St. Lawrence)	40
Northeast region (Gaspésie–Îles-de-la-Madeleine)	40
Outlook	40

Exploration investments in the territory were \$4.5 M including a financial assistance of \$455 000 from the Québec Programme d'assistance à l'exploration minière. Some 99 projects were listed and a total of 21 933 m were drilled.

Southwest region (Montreal-Chaudière-Appalaches)

Niocan (13) is continuing the development of its niobium deposit within the Colline d'Oka carbonatite complex, near Montreal. The Niocan project consists in an underground mine and in building a plant on site to transform the pyrochlore concentrates into ferroniobium. The combined reserves of two mineralized bodies (zones S-60 and HWM-2) are estimated at the present time at 13.3 Mt of ore grading 0.63 % Nb₂O₅, which could be mined for 15 years.

Following the signature of an agreement with Ressources minières Coleraine and Cancor Mines, **Allican Resources** (5) is presently undertaking a prefeasibility study to bring the chrome-bearing Coleraine and Reed-Bélanger deposits into production. These deposits are located within the Thetford Mines ophiolitic complex. To date, the ore reserves on the two properties would be 7.4 Mt at a mean grade of 6.64 % Cr₂O₃. The Allican project includes the building of a processing plant to transform the chromite concentrates into ferrochrome.

Phelps Dodge Corporation and **Silver Century Exploration** (32) continued the exploration of the Stoke copper-bearing property near Sherbrooke. In 1997, the best drilling intersection returned 5.6 m grading 5.78 % Cu with 4 m grading 7.84 % Cu.

Phelps Dodge Corporation (1) is also searching for Pb-Zn mineralizations in the block schist of the Drummondville Olistostrome in the Acton Vale sector.

Explorateurs-Innovateurs, in partnership with **Soquem** and **Virginia Gold Mines** (15) undertook exploration work including 4 drill holes totalling 100 m in the Syndicat F. Dussault project within the Saint-Daniel complex. The best intersections returned 1 m grading 4.5 % Zn with 30 cm of massive sulphides and 1.5 m grading 6 % Zn.

Centre region (Lower St. Lawrence)

Ressources Appalaches (39) drilled 73 holes totalling 5139 m on its Transfiguration project. To date, several drill holes would have intersected copper grading between

0.11 % and 1.12 % and silver grading between 0.7 g/t and 15.5 g/t on a thickness between 2 and 20 metres.

Soquem and **Ressources Appalaches** (40) drilled 16 holes totalling 1733 m on the Saint-Guy copper-bearing property of the Squatec project within the NE extension of the Transfiguration property. To date, surface work has located a series of showings within quartz sandstones and conglomerates of the Robitaille Formation; channel samplings graded between 0.1 % to 8.8 % Cu.

Ressources Appalaches (61) also carried out a drilling campaign (12 holes for a total of 1009 m) on the Sainte-Marguerite gold-bearing property in the La Vérendrye and Caspussculp townships near Causapsall. The Fraser-3 showing returned the best intersections. In 1997, one drill hole returned grades of 2.9 g/t Au, 121 g/t Ag, 0.5 % Cu, 7.3 % Pb and 2.9 % Zn over 8.5 m. Another returned 3.5 g/t Au, 13 g/t Ag, 1 % Pb and 0.3 % Zn over 7.5 m.

Northeast region (Gaspésie-Îles-de-la-Madeleine)

Near Murdochville, **Mines Gaspé** (83) carried out a vast drilling campaign (12 holes for a total of 8424 m). The three main objectives were: find new copper-bearing porphyries outside the Copper Stream alteration halo; find massive copper-bearing sulphides mantos (of the E-32 type) in the Murdochville marble halo and find copper-bearing skarns near the infrastructures of zones E-34 and E-38 currently being mined.

Mines and Exploration Noranda, in partnership with **Soquem** (88), drilled 4 holes for a total of 2096 m on the Sullipek-Vallières project in Lesseps township. The work was to find copper-bearing skarns and copper-bearing porphyries in the Chaleurs Group carbonate rocks.

Exploration Raudin (98) continued evaluating the potential of its Vondenbleu Cu-Ag property in the Mont Alexandre sector north of Chandler. The drilling campaign which began in 1997 and ended in February 1998 defined a resource of more than 240 000 tonnes grading 0.7 % Cu.

Outlook

Exploration activities could once again decrease in 1999.

The continuation of the Québec Programme d'assistance à l'exploration minière should ensure maintaining base level exploration.

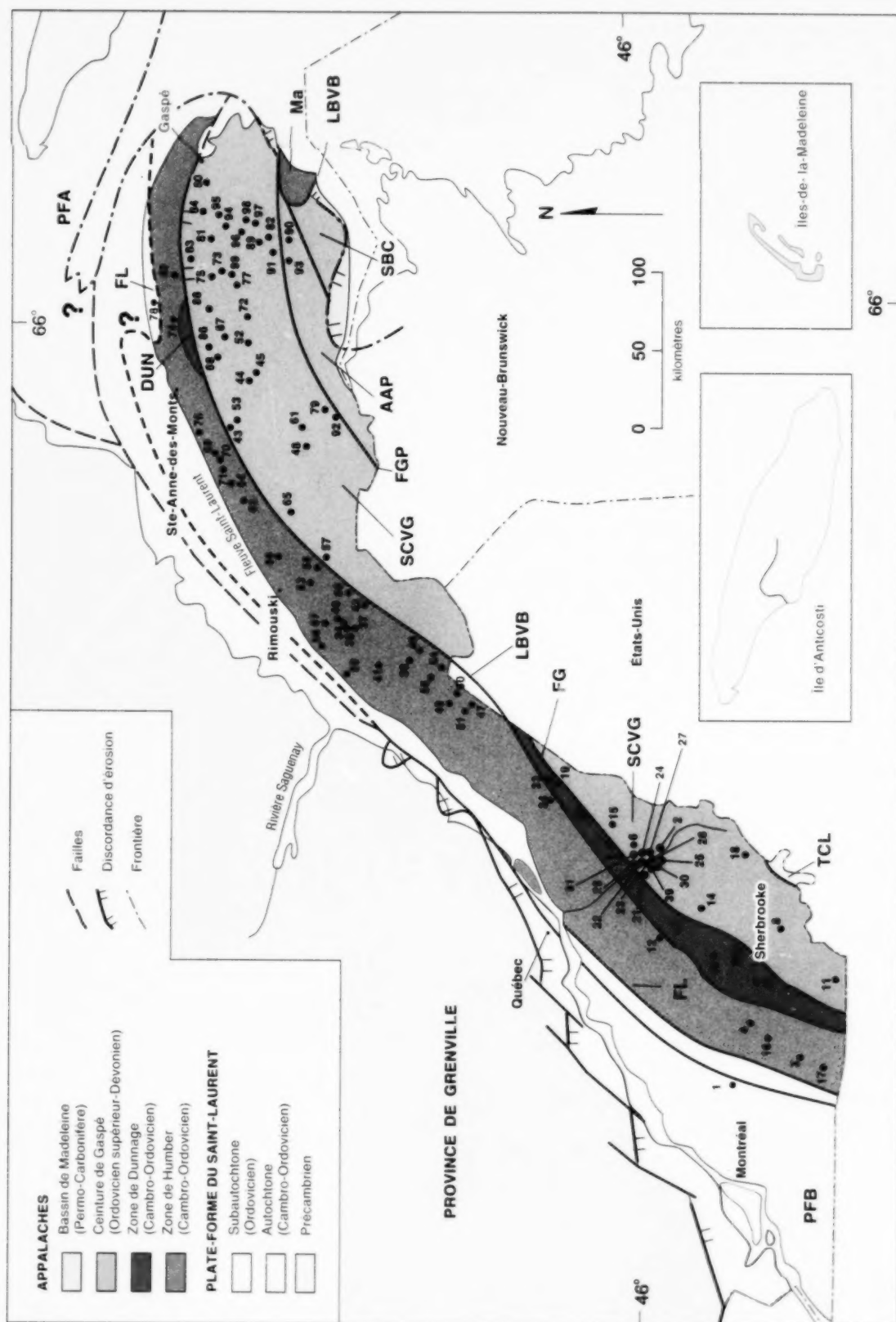


FIGURE 1F-1 — Location of 99 mineral exploration projects in 1998 (numbered 1 to 99).
Abbréviations: AAP: antichlinal d'Aroostook Perce; DUN: zone de Dunnage; FGP: zone de Dunnage; LBVB: ligne Baie Verte; Brimpton; Ma: boutonnière de Maquereau Mictaw; PFA: plate-forme d'Anticosti; PFB: synclinal de Connecticut Valley Gaspé; TCL: terrain de Chain Lakes.

TABLEAU 1F-1 – Exploration projects carried out in the Saint-Lawrence platform and in the Appalachians in 1998
(see figure 1F-1).

N°	CANTON (SEIGNEURIE)	SNRC	INTERVENANT	PROJET	SUBSTANCE	TRAVAUX ⁽¹⁾
RÉGION SUD-OUEST (MONTREAL - CHAUDIERE - APPALACHES)						
1	Acton	31H/09-10	Phelps Dodge Canada	Acton	Pb, Zn	G, PP, Gc(s), S(2:354)
2	Beauce	21E-L	SOQUEM	Autonomes Beauce	Cu, Pb, Zn, Au, Ag	Pr, E
3	Bolton	31H/01	FEMECA	Bolton	Cu, Au	Pr, E, Em, Gc(s, ro)
4	Brompton	31H/09	R. Beaudette	Windsor 98	Au	Em, Mag, Gc(s), S(2:30)
5	Corelaire	21L/03	Ressources Allican	Hall/Reed-Bélanger	Cr, Pt	S(4:400), Ev
6	Cranbourne	21L/07	FEMECA	Cranbourne	Au	Pr, E, Gc(ro)
7	Cranbourne	21L/07	C. Vachon et L. Fecteau	Cranbourne	Au, Cu, Zn	Pr, E, Em, Gc(s)
8	Ditton	21E/06	C. Royer	L'Étoile d'or	Au, Ag, Pb	Pr, E, PP, Gc(s,ro), T
9	Frampton et Cranbourne	21L/07	N. Lavoie et J. Daigle	Red Bed Copper	Cu	Pr, E, EM
10	Ham-Sud	21E/13	L. Venditelli	Lac aux Canards	Au, Cu, Ag, Zn, Pb	Pr, G, PP, Gc(s), S(nd:311)
11	Hereford et Barford	21E/04	N. Saint-Onge et D. Cutting	Mont Brunelle	Au	Pr, E, Gc(ro)
12	Irlande	21L/03	Y. Landry et M. Boulanger	Bo-Lan	Cu	Pr, E, TBF, Gc(s, ro)
13	(Lac-des-deux-Montagnes)	31G/09-08	Niocan	OKA	Nb	ET, EF
14	Lambton	21E/14	FEMECA	Lambton	Au, Cu, Pb, Zn, Ag	Pr, E, TBF, Gc(ro)
15	Langevin et Ware	21L/08	P. Gaucher (Ex-In), SOQUEM, et Mines d'Or Virginia	Syndicat F. Dussault 1998	Zn, Cu, Au	Pr, EM, E, Gc(ro), S(4:100), T
16	Orford et Brompton	31H/08-09	A. Girard et R. Beaudette	Saint-Denis	Au	Pr, E, Gc(ro)
17	Potton	31H/01	Ressources minières Coleraine	Potton	Au	Gc
18	Risborough et Spalding	21E/10	FEMECA	Frontenac	Au, Cu, Zn	Pr, E, Gc(s,ro)
19	Rolette et Talon	21L/09	A. Nazarewska	Rolette-Talon	Au, Co, Ni, Cu	Pr, E, Mag, TBF, Gc(ro)
20	Roux	21L/09	D. Jacques et F. Saint-Georges	Cabouron	Cu, Au	Pr, E, EM, TBF, Gc(s)
21	(Saint-François)	21L/02	R. Beaudoin	Chûte du Bras	Au	Pr, E, EM, Gc(ro)
22	(Saint-François)	21L/02	F. et Y.L. Gagnon	LG-1	Au	S(1:103,6)
23	(Saint-François)	21L/02	R. Grondin	Beauceville 1998	Au	Pr, Mag, S(1:56), T
24	(Saint-François)	21L/02	N. Lassonde	Rivière Gilbert	Au	T
25	(Saint-François)	21L/02	F. Mainville	FDM Saint-Joseph	Au	PP, S(3:64)
26	(Saint-François)	21L/02	R. Mainville et FEMECA	Rapide du Diable	Au	S(1:108,5)
27	(Saint-François)	21L/02	R. Mainville	Saint-Simon	Au	Pr, Gc(s)
28	(Saint-François)	21L/02-07	P. Mrakic	River Noire 1998-A	Au, Cu, Ni, Ag	Pr, E, Gc(ro), T
29	(Saint-François)	21L/02	P. Mrakic et J. Abeline	Meules Creek 1998-A	Au	Pr, E, Gc(ro)
30	(Saint-François)	21L/02	J. Ouellette	Du Moulin 1998	Au, Cu, Pb, Zn	Pr, PP
31	(Saint-François)	21L/02	9020-2607 Québec Inc.	Saint-François Nord	Au	G, Gc(ro)
32	Stoke	21E/05-12	Phelps Dodge Canada et Silver Century Exploration	Ascot/Stoke	Cu, Zn	Pr, PEM, Grav, S(5:672,7)
33	Talon	21L/09	G. Galarneau	Talon	Cu, Au, Ni	Pr, E, EM, Mag, Gc(ro)
34	Talon et Patton	21L/09-16	M. Bilodeau et D. Bilodeau	Apolline	Au	Pr, E, EM, Gc(ro)
35	Weedon	21E/11	Nomex Explorations Inc.	Weedon	Cu, Zn, Pb, Ag, Au	Pr, PP, S(2:282)
RÉGION CENTRE (BAS-SAINT-LAURENT)						
36	Armand et Cabano	21N/11	FEMBSL	Montagne Blanche	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
37	Bédard	22C/02	FEMBSL	Saint-Guy	Cu, Pb, Zn	Pr, E, EM, Gc(ro), T
38	Bédard	22C/02	J. Leduc	Point Limite	Cu, Pb, Zn, Au	Pr, E, EM, Gc(s,ru,ro)
39	Bédard, Biencourt et Robitaille	21N/15	Ressources Appalaches	Transfiguration	Cu, Ag	Gc(s), S(73:5139), T

TABLEAU 1F-1 - (continued)

N°	CANTON (SEIGNEURIE)	SNRC	INTERVENANT	PROJET	SUBSTANCE	TRAVAUX ⁽¹⁾
40	Bédard, Chénier et (Nicolas-Rioux)	22C/02	SOQUEM et Ressources Appalaches	Squatec (Saint-Guy)	Cu	Pr, G, E, PP, Gc(s), S(16:1733), T
[41]	Bégon, Demers, Denonville, Hocquart, Raudot, Viger, Whitworth	21N/14	FEMBSL	Saint-Clément	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
[42]	Biencourt	21N/15	FEMBSL	Biencourt	Cu, Pb, Zn	E, T, Gc(ro)
[43]	Blais, Cuoq, Joffre, Langis, Le Clercq et Tessier	22B/10- 11-15	FEMBSL	Faillie Shickshock Sud	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
[44]	Boutet et Dunière	22B/10	FEMBSL	Ruisseau des Mineurs	Cu, Pb, Zn	Pr, E, Gc(ro)
[45]	Boutet, Dunière, Catalogne et Lagrange	22B/10	FEMBSL	Volcanites de Boutet	Cu, Pb, Zn	Pr, E, Gc(ro)
[46]	Cabano	21N/10-11	J.P. Pelletier(2)	Beauséjour	Cu, Pb, Zn	Pr, E, Gc(ro)
[47]	Cabot, Chapais et Painchaud	21N/03-04- 05-06	FEMBSL	Saint-Athanase	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
[48]	Casupscull	22B/06	FEMBSL	Grès de Causapscal	Cu	Pr, E, Gc(ro)
49	Chabot	21N/06	J. Guillot(2)	Roland 98	Cu, Pb, Zn, Au, Ag	Pr, E, EM, Gc(s,ru,ro), T
[50]	Chabot	21N/06	R. Tourigny(2)	Chabot 98	Au, As, Cu	Pr, E, Gc(ru,ro)
51	Chapais et Painchaud	21N/03-04	J. Lévesque	Saint-Athanase	Au, Zn, Cu, Sb, Pb	Pr, E, Gc(ro)
[52]	Clarke, Dunière, Gravier et Richard	22B/09	FEMBSL	Grès rouges	Cu	Pr, E, Gc(ro)
53	Cuoq et Le Clercq	22B/10-11	SOQUEM et Exploration Oracle	Réserve Matane	Cu	Pr, Gc(ro)
54	Estcourt	21N/06-11	N. Fournier	Prospection Professionnelle 1998	Au, Ag, Cu, Co, Sb, U	Pr, E, Gc(ro)
[55]	Estcourt et Pohénégamook	21N/06-11	N. Fournier et B. Pineau	La Roche Dure et Volcan	Au, Ag, Cu, Zn, Ni	Pr, E, Mag, TBF, Gc(ro), T
[56]	Fleuriau	22C/08	J.M. Hammond	Mont-Comi	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
[57]	Flynn	22C/01	L. Dubé	Lac Huron	Cu, Pb, Zn	Pr, E, Gc(ro)
[58]	Flynn	22C/01	J. Leduc	Lac du Porc-Épic	Cu, Pb, Zn	Pr, E, Gc(ru,ro)
[59]	(Isle-Verte)	22C/03	J. Thibault	Saint-Éloi	Cu, Pb, Zn	Pr, E, Gc(ro)
[60]	La Roche	22C/02	FEMBSL	Esprit-Saint	W	Pr, E, Gc(ml, ro)
61	La Vérendrye et Casupscull	22B/06-07	Ressources Appalaches	Sainte-Marguerite	Au	T, S(12:1009)
[62]	MacNider	22B/12	R. Turcotte	MAC	Cu, Pb	Pr, E, Gc(ro)
[63]	Macpès et Duquesne	22C/01	R. Dubé	Lac Pointu	Ba, Zn, Cu, Ni, Pb	Pr, E, Gc(ro)
64	Matane	22B	SOQUEM et Exploration Oracle	Matane	Cu	Pr, G, PP, Gc(s)
[65]	Nemtayé, Massé et (Lac Mitis)	22B/05	J.Y. Lévesque	Lac Mitis	Au, Cu	Pr, E, Gc(ro)
[66]	(Nicolas-Rioux)	22C/02	FEMBSL	Saint-Mathieu	Cu, Pb, Zn	E, T, Gc(ro)
[67]	(Nicolas-Rioux 3)	22C/02	FEMBSL	Ruisseau Dumont	Au, Cu, Pb, Zn	Pr, E, Gc(ro)
[68]	Richard	22B/16	FEMBSL	Diabase du ruisseau du Dix-septième mille	Ni, Cr, Co, Zn	Pr, E, Gc(ro)
[69]	Saint-Denis	22B/14	J. Roy	Saint-Adelme	Cu, Ag, Ba	Pr, E, Gc(ru,ro)
70	Saint-Denis et Tessier	22B/14	Exploration Oracle	Saint-Denis - Tessier	Cu, Ag, Co, Ba	Pr, G, Mag, TBF, PP, Gc(s)
[71]	Tessier	22B/14	C. Saint-Pierre	Saint-Luc	Cu, Ag, Ba	Pr, E, Gc(ru,ro)

TABLEAU 1F-1 - (continued)

N°	CANTON (SEIGNEURIE)	SNRC	INTERVENANT	PROJET	SUBSTANCE	TRAVAUX ⁽¹⁾
RÉGION NORD-EST (GASPÉSIE - ÎLES-DE-LA-MADELINE)						
72	Baldwin	22B/09	G. Therrien	Cache Plomb	Cu, Pb, Zn, Ag	Pr, E, Gc(ro)
73	Baldwin, Deville et Walbank	22A/12	G. Gasse	Bonaventure	Zn, Pb, Cu	Pr
74	Boisbuisson et Christie	22G/01	A. Gauthier	Valmont II	Au, Cu, Ag, Zn, Pb	G, E, T, Gc(t)
75	Bonnécamps et Walbank	22A/13	R. Béland	Aventure	Cu, Au	Pr, E, Gc (s, ro)
76	Dalibaire	21B/14	L. Leclerc et A.T. Leblanc	Dalibaire	Cu, Pb, Zn	Pr, E, Gc(ro)
77	Deville	22A/12	C. Gasse	Bonaventure Ouest	Pb, Co	Pr
78	Duchesnay et Boisbuisson	22H/04	A. et M.L. Leclerc	Rivière-à-Pierre	Cu, Pb, Zn, Au	Pr
79	Fauvel	22B/02	B. Boulanger	Fauvel	Au	Pr, E, Gc(ro)
80	Galt	22A/15	G. Cabot	Galt	Pb, Zn, Ag, Cd, Ba	Pr, G, E, Gc(s), T
81	Gaspésie	22A-B	SOQUEM	Autonomes Gaspésie	Cu, Pb, Zn, Au, Ag	Pr
82	Guéguen, Mourier et Raudin	22A/11	P. Grenier	Guéguen - Ne	Cu, Ag	Pr, E, Gc(ro)
83	Holland, Bonnécamps et La Rivière	22A/13-14	Mines Gaspé	Exploration Mines Gaspé	Cu, Ag, Mo	PEM, S(12:8423,6)
84	Laforce	22A/14	J.B. Beaudin	Lac Bourget	Cu, Pb, Zn, Ag	Pr, E, Gc(ro)
85	La Rivière	22H/04-05	Y. Chouinard et R. Béland	Lac Guillot	Cu	Pr, E, Gc(ru,ro)
86	Lemieux	22B/16	A. Gagnon	Gaspéite	Ni	Pr, E
87	Lemieux	22B/16	Y. et G. Gasse	Dionne	Cu, Au, Ag, Pb, Zn	Pr, G, E, Gc(ro), T
88	Lesseps	22A/13, 22B/16	Mines et Exploration Noranda et SOQUEM	Sulipek - Vallières	Cu	PEM, S(4:2096)
89	Mourier	22A/11	A. Henry	Boca	Cu, Ag	Pr, E
90	Reboul	22A/01	F. Bernard	Reboul	Au, Ag, Cu	Pr, E
91	Reboul et Guéguen	22A/06-11	Y. Morin	Guéguen Reboul	Cu, Ag	Pr, E
92	Ristigouche	22B/02	Ressources Appalaches	Ristigouche	Au	Pr, G
93	Robidoux	22A/05	A. Nazarewska et E. Bawolak	Robidoux gold	Au, Ag, Pb, Zn, Sb	Pr, G, E, Mag, TBF, Gc(ro), T
94	Sirois	22A/11	S. Poirier et M. Forest	Stima	Ni, Cu, Ag, Au	Pr, E, Gc(ro)
95	Sirois et Laforce	22A/14	L. Leblanc	Lac Edward	Cu, Pb, Zn, Ag	Pr, E
96	Vondenvelden	22A/11	V. Arsenault	Targuette	Cu, Ag	Pr, E
97	Vondenvelden	22A/11	J.B. Beaudin et L. Leblanc	Triangle d'argent	Cu, Ag	Pr, G, E, Mag, TBF, Gc(ro), T
98	Vondenvelden et Raudin	22A/11	Exploration Raudin	Mont-Alexandre	Cu, Ag	S(4:1050)
99	Walbank et Deville	22A/12	R. Savard	Bonaventure-Sud	Cu, Pb, Zn, Au, Ag	Pr

1. LÉGENDE DES TRAVAUX D'EXPLORATION

DEEM Levé électromagnétique type «pulse» en forage
 E Échantillonnage
 EF Étude de faisabilité et/ou de marché
 EM Levé électromagnétique
 ET Étude d'évaluation technique
 Ev Échantillonnage en vrac
 G Levé géologique
 Gc Levé géochimique non défini
 Gc(h) Levé géochimique d'humus
 Gc(l) Levé géochimique de fond de lac
 Gc(ml) Levé géochimique de minéraux lourds
 Gc(ro) Levé géochimique de roches
 Gc(ru) Levé géochimique de ruisseaux
 Gc(s) Levé géochimique de sols
 Gc(t) Levé géochimique de till

Gp Levé géophysique non défini
 GpA Levé géophysique aérien
 Grav Levé gravimétrique
 Mag Levé magnétométrique
 PEM Levé électromagnétique type «pulse»
 PP Levé de polarisation provoquée
 Pr Prospection
 S(nb:m) Sondage au diamant (nombre : mètre total)
 Sci Sondage de circulation inversée
 T Excavation de tranchée et décapage
 TBF Levé électromagnétique basse fréquence
 TM Test métallurgique
 * Travaux d'exploration réalisés au chantier
 gras Projet à l'étape de mise en valeur
 Projet subventionné par le MRN

CHAPTER 2

Construction materials, industrial minerals and peat

Yves Bellemare
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Construction materials

In Québec, on December 31 1998, there were more than 800 active titles (Permis de recherche de substances (PRS) [Exploration licence for surface mineral substances] and Bail non-exclusif temporaire (BNEP)) for construction materials exploration. Over half of these titles were registered in 1998.

In the Saint-Marc-du-Lac-Long region, there are over 250 active PRSs (NTS 21N/06, 21N/07 and 21N/10) where **Glendyne** is operating a slate quarry. In 1998, the company acquired more than 175 titles and undertook a vast geological mapping campaign. The Saguenay-Lac-Saint-Jean (NTS 22D, 22E, 32A and 32H) is also an active region with over 275 active titles.

A total of 47 projects in which exploration work was carried out for construction materials were brought to our attention. **Colombia Granite** acquired the mining rights from Mr. Roger Ouellet in the Cimon township (NTS 22D/07) and started development work on a green granite identified as Verde La Baie. In October, **Pender Capital** of Vancouver stated its intention to purchase all interests in **Granigroupe** which comprises **Colombia Granite**.

Société minière Polycor continued the exploration work started a few years ago in the Port-Cartier and Magpie regions in the Upper- and Mid-North Shore. In 1998, one focus for cut stone was on a property located in NTS 22J/03. The green granite is known as Vert Saint-Laurent. More work will be carried out in 1999.

Granite Pérignon acquired the mining rights in the Lemoine Lake sector (NTS 22E/06). Development work confirmed the good quality of a brown granite, probably an anorthositic rock. The product will bear the commercial name of "Brun Mystique" and will be used for tombstones. **Excavations Montauban** carried out stripping and sampling on its Vert Boréal property (NTS 31I/16). The rock is a greenish grey farsundite or quartz mangerite from the Gagnon pluton of the Rivière-à-Pierre charnockite suite.

Industrial minerals

Mining

There were 28 mines or quarries in operation in the industrial minerals sector in 1998. Products include: asbestos (3 mines); high purity limestone and dolomite (6 quarries); silica (11 quarries); titanium minerals; flake graphite, crushed mica, talc, steatite and wollastonite (1 mine or quarry each).

The industrial minerals sector was affected by a few recent closings. The British-Canadian and King Beaver asbestos mines in the Thetford Mines area closed due to lower demand; the Saint-Ludger and Sainte-Edwidge quartz mines in the Eastern Townships because of the depletion of the reserves. The new wollastonite mine owned by **Ressources Orléans** in Saint-Ludger-de-Milot is put on hold due to marketing difficulties for its products.

Exploration

Twenty four exploration projects concerning ten industrial rocks and minerals were reported in 1998 (Figure 2.2 and Table 2.2). These projects included basic prospecting to deposit appraisal or advanced development work on known resources.

Minerais Bruneau continued work to bring a deposit of white calcitic limestone into production (site 54); this site was discovered in the Dulain Lake sector, 150 km north of Chicoutimi. A prefeasibility study confirmed the viability of the project, a feasibility study should follow in 1999.

In the Gaspé, **Cimbec** carried out drilling for its cement plant project in Port-Daniel.

Work was also carried out on the Romaine Formation dolomite in the Sainte-Geneviève Hill sector, east of Havre-Saint-Pierre.

For silica, tests were carried out on the **Mines JAG** quartzite deposit north of Saint-Urbain for the production of ferrosilicon. Sandstone deposits were prospected in the Gaspé Peninsula, quartzites in the Saguenay and quartz veins in the Eastern Townships.

The joint venture **Soquem-Norsk Hydro** on the Sept-Îles apatite-ilmenite deposit continued in 1998 with pilot plant testing on a new concentration process to improve ilmenite recovery.

The **Niocan** project to develop a niobium deposit associated with the Colline d'Oka complex also has an apatite component. In 1998, preliminary concentration testing was carried out to recover the apatite from the niobium circuit rejects.

This year, more than 2 million dollars were invested in diamond exploration, especially in the Far-North. **Ditem Exploration** carried out work in the Monts Otish region.

Peat

In 1998, there were 23 producers extracting peat from some 40 deposits located mostly in the Lower St. Lawrence, on the North Shore and in the Saguenay-Lac-Saint-Jean regions. Shipments in 1997 were 8 125 000 bags of 170 dm³, for a global value of \$38.9M. Preliminary data for 1998 suggest an increase of nearly 8 % in shipments and values that could attain \$43M. While Québec was for the longest time the main Canadian peat producer, New Brunswick is now dominating this sector more and more. Their shipments for 1997 rose to 10 200 000 bags and could be over 11 000 000 bags of 170 dm³ for 1998.

With the arrival of three new producers in Nova Scotia, the consolidation of this activity sector in New Brunswick, the depletion of reserves for the Québec producers and the closing of certain companies, the next few years will probably see a gradual decrease in the Québec proportion of Canadian shipments.

1998 also had its share of production impediments. After an early start in May, June had heavy rainfall thus leading to less extraction, and this situation lasted into July. The

producers of the North Shore and the Lac-Saint-Jean regions were the most severely affected while those of the Lower St. Lawrence, who extract peat that is generally more decomposed, suffered less from the weather effects. With

drier conditions in August, a rebuilding of a good part of the inventories were restocked; certain producers even extended the harvest season into September in spite of the shorter daily extraction periods.

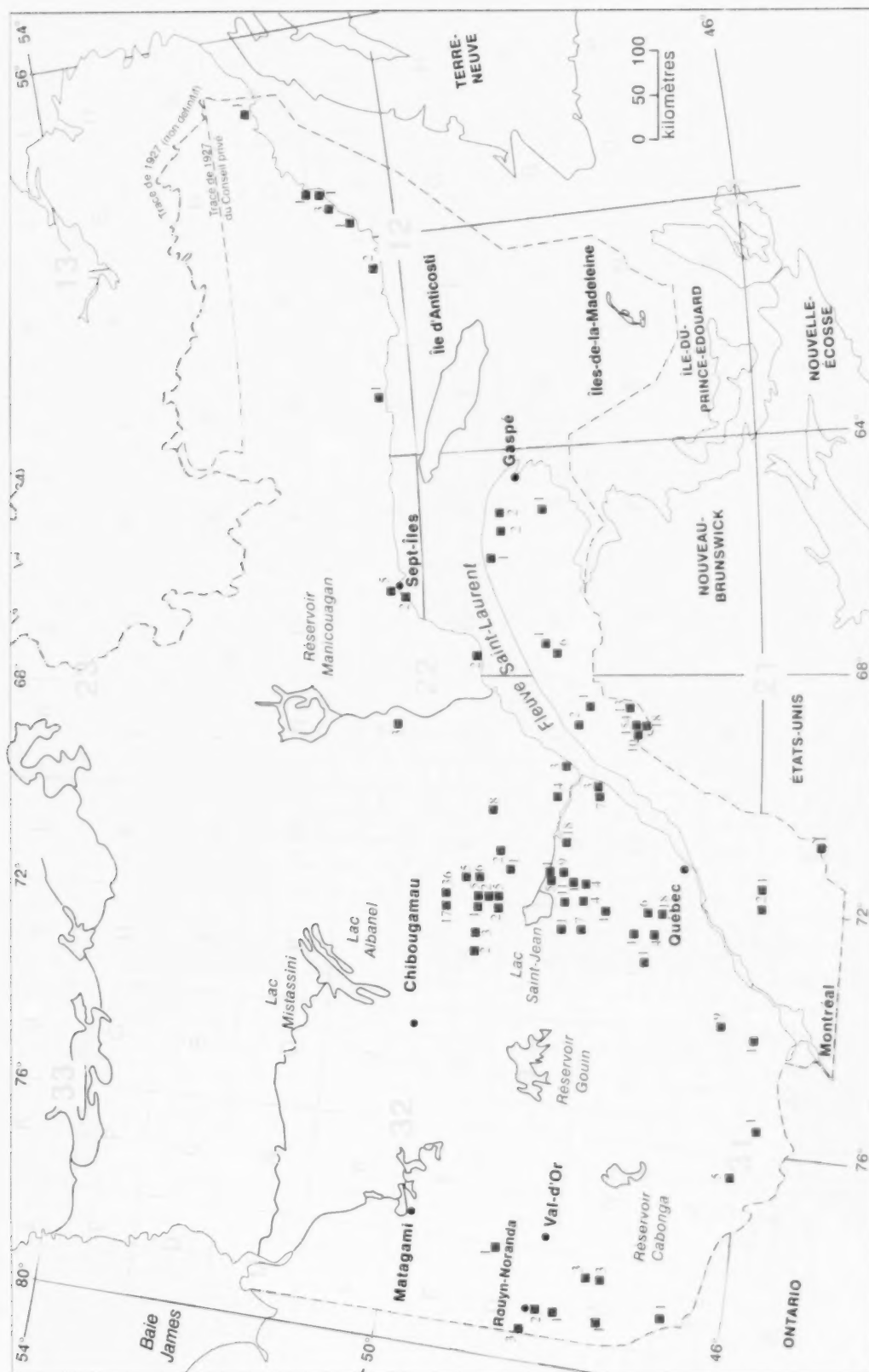


FIGURE 2.1 Location and number of active exploration licences granted in 1998 for building materials.

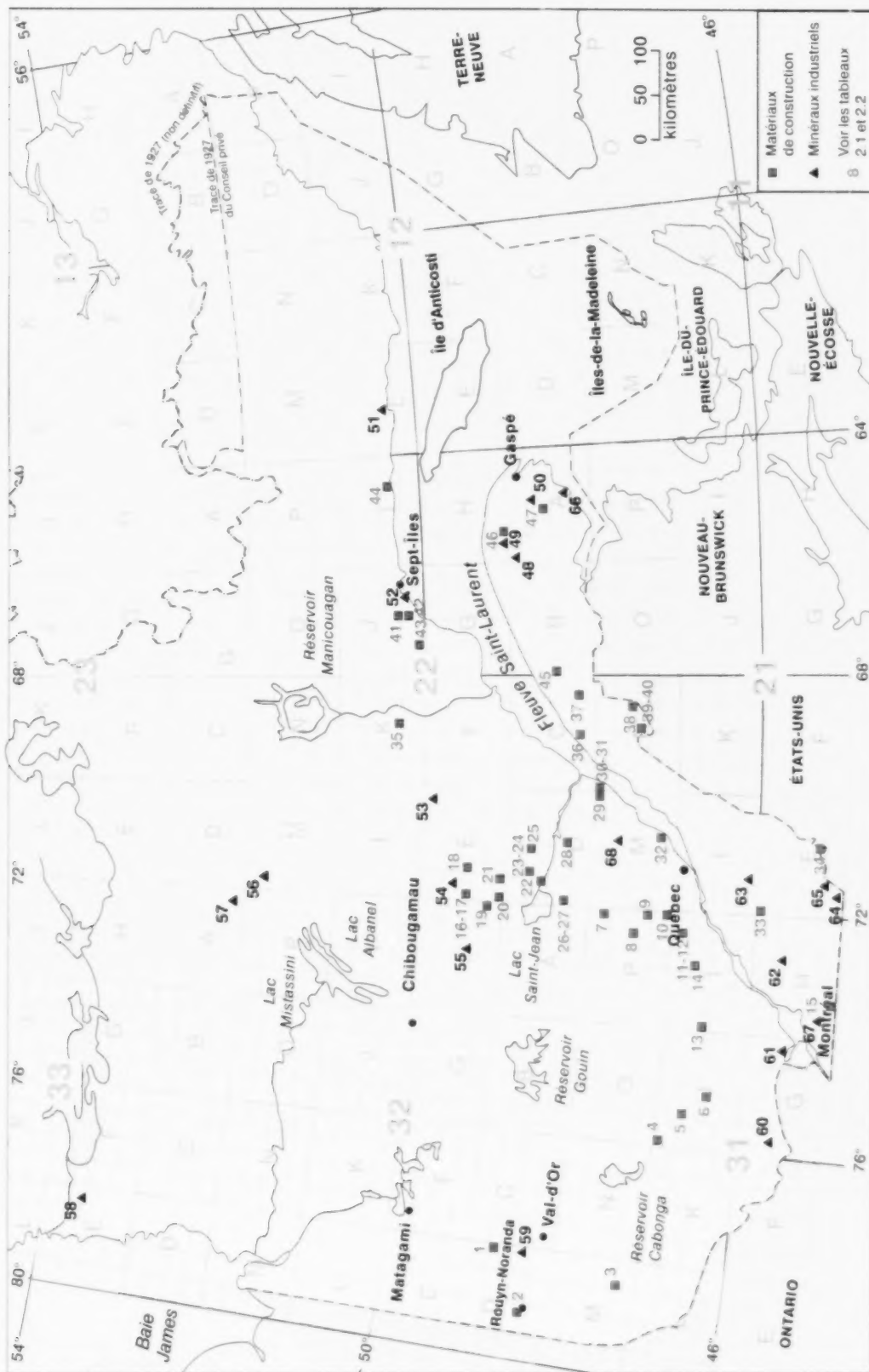


FIGURE 2.2 Location of exploration projects in Quebec in 1998. Industrial minerals and building materials.

TABLEAU 2.1 – Exploration projects for building materials carried out in Québec in 1998.

SITE	SNRC	TITRE *	DÉTENTEUR	USAGE **	TYPE DE TRAVAUX ***	DÉTAILS
1	32D 9	4090	Denis Cyr	PA	Pr, Gc	Diabase granoclastique à olivine
2	32D 6	3799-3801	Jason Warren, Gérard Houle	GD	Pr, T, S, E, Gc	Projet Porhyre d'Aldermac; porphyre feldspathique rose orangé
3	31M 8	4062-4064	Normand Gibson	PA	Pr, E	
3	31M 9	4065-4068	Normand Gibson	PA	Pr, E	
4	31J 12	Aucun	Gérard Houle	GD	T, S, E	Projet Chute 4 Pattes; calcite rose orangé
5	31J 11	Aucun	Rock of Ages du Canada	PA	T, E, Gc	Projet Bianky, monzogranite de type Rose Laurentien
6	31J 6	3081-3084	Rock of Ages du Canada	PA	T, E, Gc	
7	31P 16	3818	Fonds minier du Saguenay-Lac-Saint-Jean	PA	E	Projet Kiskissink, gneiss granitique rouge, option par Res. d'Ariane
8	31P 8	3971	Gestion Yoguy	PA	E	
9	31P 8	3779-3785	1864-1376 Québec	PA	E, Gc	Granit rose
10	31P 1	BEX 178	A. Lacroix et Fils	PA	T, E, Gc	Car. Bleu Atlantique
11	31I 16	3155-3157	Excavations Montauban	PA	E, Gc	Variété Vert Boréal
12	31I 16	3102	2329 1677 Québec	PA	E	PRS renouvelé en 1998
12	31I 16	3294	2329 1677 Québec	PA	E	
12	31I 16	3297-3300	2329 1677 Québec	PA	E	
13	31I 12	BEX 247	Granidor	PA	E	Granit vert foncé à grain fin, chemin minier
14	31I 10	Aucun	P.H. Vincent	PA	T, E	Résultats négatifs
15	31H 3	Aucun	Carrières Polycor	PA	Gc	Marbre calcitique (calcilutite) gris blanchâtre
16	22E 5	3511-3515	Jean-Paul Deschênes	PA	S	Résultats négatifs
17	22E 5	3997-3998	François Gobeil	PA	T	
18	22E 6	3838-3850	Maryse et Jean-Claude Montminy	PA	T, E, Gc	Variété Brun Mystique, BEX 299
19	32H 1	4256-4257	A. Lacroix et Fils	PA	E	
20	22E 4	3067	2329 1677 Québec	PA	E	Farsundite porphyroïde à grain grossier
20	22E 4	3321-3325	2329 1677 Québec	PA	E	Farsundite porphyroïde à grain grossier
21	22E 4	3600-3602	Olivier Perron	PA	T	
21	22E 4	3825-3828	Olivier Perron	PA	T	
22	22D 12	Aucun	A. Lacroix et Fils	PA	T, E, Gc	Car. Noir Atlantique, variétés Vert Nordix et Noir Forêt
23	22D 11	Aucun	A. Lacroix et Fils	PA	T	Car. Rose Atlantique
24	22D 11	4103	François Villeneuve	PA	E	
25	22D 11	3329	Henri Boily	PA	E	Anorthosite noire à labradorite
26	22D 5	3467-3468	Fonds minier du Saguenay-Lac-Saint-Jean	PA	E	Projet Camp d'exploration # 1, granite rouge, option par Colombia Granite
27	22D 5	3095-3096	Rémi Belley	PA, MI	E	Quartz, granite, (surtout des cristaux de quartz)
28	22D 7	2146, 2149	Granicor	PA	T, E, Gc	Transfert des titres de Roger Ouellet, BEX 292-293, variété Verte La Baie
29	21M 16	3775-3778	Denise Fortin	PA	E	Pierre rose
30	21N 13	2979-2983, 3116	2329 1677 Québec	PA	E, Gc	
31	21N 13	2961-2962	Denise Fortin	PA	E	Pierre rose, titres échus
32	21M 2	Aucun	Béton de la Capitale	PC	T, E, Gc	Production envisagée de granulats pour béton
33	21E 13	3631	Carrière D.G.	PC	E	

TABLEAU 2.1 – (continued)

SITE	SNRC		TITRE *	DÉTENTEUR	USAGE **	TYPE DE TRAVAUX ***	DÉTAILS
34	21E	2	3736	Linda Brochu	GD	E	Pierre décorative de silice, ancien PRS 2005
35	22K	7	4114-4116	Carrières Polycor	PA	Pr	Granit orangé
36	22C	2	3147, 3193	Christian D'Amours	PA, PB	T, E	Grès
36	22C	3	2440	Grès Basques	PA, PB	T, E	Grès, rapport géologique en 1996 (GM-54547)
37	22C	1	3064	Irénée Saint-Laurent et fils	PC	Gc	BEX 277 émis sur une partie du PRS
38	21N	10	4033-4045	Glendyne	PA	G	Ardoise
39	21N	6	3869-3873	Glendyne	PA	G	Ardoise
39	21N	6	3874-3875	Glendyne	PA	G	Ardoise
39	21N	6	4056-4058	Glendyne	PA	G	Ardoise
39	21N	7	3968	Glendyne	PA	G	Ardoise
39	21N	7	3225-3229	Glendyne	PA	G	Ardoise
39	21N	7	3517-3543	Glendyne	PA	G	Ardoise
39	21N	7	3544-3560	Glendyne	PA	G	Ardoise
39	21N	7	3561-3584	Glendyne	PA	G	Ardoise
39	21N	7	3585-3599	Glendyne	PA	G	Ardoise
39	21N	7	3657-3705	Glendyne	PA	G	Ardoise
39	21N	7	3876-3904	Glendyne	PA	G	Ardoise
39	21N	7	3905-3906	Glendyne	PA	G	Ardoise
39	21N	7	3907-3966	Glendyne	PA	G	Ardoise
39	21N	7	4027-4032	Glendyne	PA	G	Ardoise
39	21N	7	4046-4055	Glendyne	PA	G	Ardoise
40	21N	7	2485	Richard Lemay	PA	S	Ardoise, résultats positifs, anciens travaux (GM 54704)
41	22J	7	3376-3379	Carrières Norgranit	PA	Pr	Gallix II
41	22J	7	3319-3320	Carrières Polycor	PA	Pr	Gallix II
42	22J	2	3380-3382	Carrières Norgranit	PA	T	Gallix I, BEX 262
43	22J	3	3865-3867	Carrières Norgranit	PA	G, E	Variété Vert Saint-Laurent
44	22I	7	2237, 2240-2243	Carrières Norgranit	PA	T, S, GC	
44	22I	7	3372-3374, 3375	Carrières Norgranit	PA	T, S, GC	Travaux en cours depuis 3 ans (travaux de 1996; GM-54417)
44	22I	8	3034-3036	Carrières Polycor	PA	T, S, GC	
45	22B	5	4002-4006	Les Calcaires R.V.B.	PC	Pr, E	À l'ouest de l'ancien BEX 039
46	22H	3	3044	Jean-Marc Marin, Jean-Yves Lavoie	PA	S, E, Gc	Calcaire gris pâle
47	22A	11	4080	Vital Arsenault	PA	Pr, T, E	Marbre fossilifère

* Numéro de PRS, sauf indication contraire

** GD: granulat décoratif; PA: pierre architecturale; PB: pierre à bâtir; PC: pierre concassée ou d'enrochement; MI: minéraux industriels

*** Pr: prospection; G: levé géologique; GC: géochimie de roche ou test; E: échantillonnage; S: sondage; T: tranchée ou décapage

☐ Projet subventionné par le MRN

Tableau 2.2 – Exploration projects for peat and industrial minerals carried out in Québec in 1998.

SITE	CANTON / SEIGNEURIE	RESPONSABLE	PROJET	SUBSTANCE	TRAVAUX ⁽¹⁾
52	Arnaud	SOQUEM / Norsk-Hydro	Sept-Îles	Apatite / ilménite	TM
53	Crevier	SOQUEM	Crevier	Syénite à néphéline	TM
54	SNRC 22M/13	SOQUEM	Lac Indicateur	Magnésite	TM
55	SNRC 22E Canton 536	Minerais Bruneau inc.	Dulain	Marbre calcitique	
56	Port-Daniel	Cimbec inc.	Cimenterie de Port-Daniel	Calcaire	S
57	Courtemanche	G. Lachambre	Mont Sainte-Geneviève	Dolomie	S
58	Larivière	J. M. Marin J.Y. Lavoie	Larivière	Silice (grès)	T, E
59	Power	B. Saint-Pierre	Montagne Blanche	Calcaire	G
60	33A/1	Ditem Exploration	Lac Hippocampe	Diamant	G, GP
61	Upton	Ressources Robex inc.	Upton	Barytine	E, F
62	Lamothe	Ressources Raymor	Lamothe	Lithium, feldspath, mica	EF
63	Auckland	Christian Royer	La Perle	Quartz	T, E
64	Lac-des-Deux- Montagnes	Niocan inc.	Oka	Niobium Apatite	EF, TM
65	22D16	Gilles Bouchard	Lac Emmurailé	Silice (quartzite)	G, E
66	Hereford	Christian Royer	Saint-Venant	Quartz	G, GP
67	Ireland	R. Bourgault Gilles Binet	Byn-Bour	Stéatite	T, E, S
68	Deslandes	G. Gasse	Silice Madeleine	Silice (grès)	T, E
69*	Templeton	F. Pageau	Lac McGregor	Quartz et feldspath	E
70*	33E/01	Monopros Ltd	Wemindji	Diamant	S
71*	31H/4	Mines JAG Itée	Sainte-Clotilde	Silice (grès)	S
72*	22 - 23 - 24 - 32	BHP Minerals Canada	Reconnaissance Grand-Nord	Diamant	Pr, Gc
73*	Charlevoix-I	Mines JAG Itée	Leeds Metal	Silice (quartzite)	TM
74*	34, 33 nord 24 ouest 23 ouest	SOQUEM/ Ashton Mining	Reconnaissance Grand-Nord	Diamant	Pr, Gc
75*	23M/11	SOQUEM/Ashton Mining	Lac Gayot	Diamant	Pr, E, G, Gc

1- **Légende E** : échantillonnage, EE : étude environnementale, EF : étude de faisabilité, ET : étude technique et compilation, Gc : géochimie de sols, de roche ou de ruisseaux, Gp : levé géophysique au sol, Pr : prospection, S : sondage, T : tranchée et décapage, TM : test de métallurgie

* Non localisés sur la carte

☐ Projet subventionné par le MRN

CHAPTER 3

Financial assistance for mining exploration

Pierre Marcoux

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This chapter groups mining exploration work that benefited from ministère des Ressources naturelles (MRN) financial assistance in 1998. The subsidized work is shown on Figures 3.1 (prospector projects) and 3.2 (company projects). The description of these projects is given in Chapters 1 and 2 of the report.

Measures

In order to support mining exploration activities in Québec, the MRN offers various financial assistance programs for prospectors, regional exploration funds, companies and Native Peoples communities of the Near- and Far-North regions. These are: Programme d'assistance à l'exploration minière du Québec (PAEM) [Québec mining exploration program], Programme d'exploration du Moyen-Nord (PMN) [Near-North mining exploration program], Programme des fonds miniers autochtones dans les régions du Moyen et du Grand-Nord (PFMA) [Native Peoples mining fund in the Near- and Far-North regions] and a new measure introduced in September, the Programme des forages profonds dans la sous-province de l'Abitibi (PFPA) [Deep drilling program for the Abitibi Subprovince].

The MRN has slated a budget of \$6M to implement these various programs in 1998-1999. On December 31 1998, the amounts allocated per intervention category were:

- \$1.3 M to prospectors for 222 projects;
- \$0.3 M to regional funds for internal projects;
- \$4.1 M to companies for 94 projects;
- \$0.3 M to a Native Peoples mining fund.

Programs for prospectors and regional mining funds

According to component A of the PAEM, autonomous prospectors can obtain up to \$4000 in grants for a project of basic prospecting (not on claim) and up to \$15 000 for an advanced prospecting project. The MRN signed agreements with regional mining funds giving them the management of this component for their region: the funds are to be managed according to the same rules as elsewhere in Québec.

Regions covered by these funds include the Lower St. Lawrence, the Gaspé, the Saguenay-Lac-Saint-Jean and the Estrie-Chaudière-Appalachians, the latter agreement was signed last autumn. The MRN contributes \$800 000 to these regional funds.

Prospectors submitted some 360 requests for financial assistance for all Québec regions combined. Two hundred and twenty two (222) projects were accepted for a total assistance amount of \$1 280 000: 123 projects managed by the MRN (\$770 000) and 99 projects managed by the regional funds (\$510 000). The regional funds also used the rest of the MRN grant (\$290 000) for internal prospecting projects.

Companies

Financial assistance to companies can attain \$50 000 per project as pursuant to component B of the PAEM and the Deep drilling program for the Abitibi Subprovince. This assistance can attain \$100 000 if the project is located in the Near-North (PMN).

There were many requests by companies for financial assistance, more than 230 projects for the three programs. The amounts granted to companies by the MRN within the various programs reached \$4 084 000 for 94 exploration projects:

- PAEM - \$2 230 000 for 51 projects;
- PMN - \$1 206 500 for 16 projects;
- PFPA - \$647 500 for 27 drill holes.

The amounts invested by the companies for these grant-aided projects totalled more than \$8 M.

Native Peoples mining funds

The Nunavik mining exploration fund received \$300 000 in financial assistance from the MRN within the PFMA. During the year, the fund financed various information and promotion activities on the Nunavik territory. It also funded the training of 20 Inuit prospectors and carried out prospecting and compilation of geoscientific data for that region.

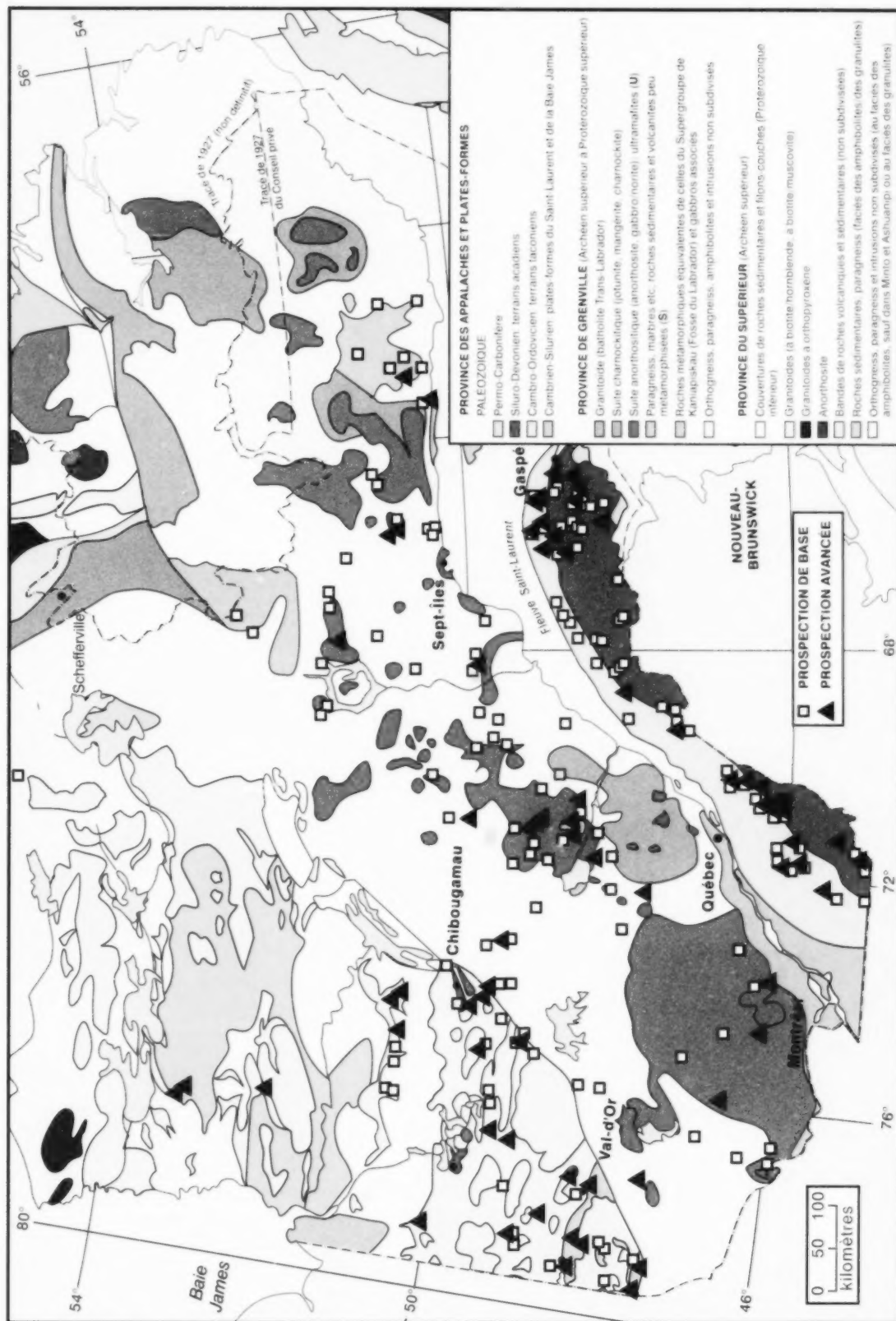


FIGURE 3.1 — Location of prospecting projects subsidized by the MRN in 1998-1999. (Basic prospecting — Volet A.1; advanced prospecting — Volet A.2).

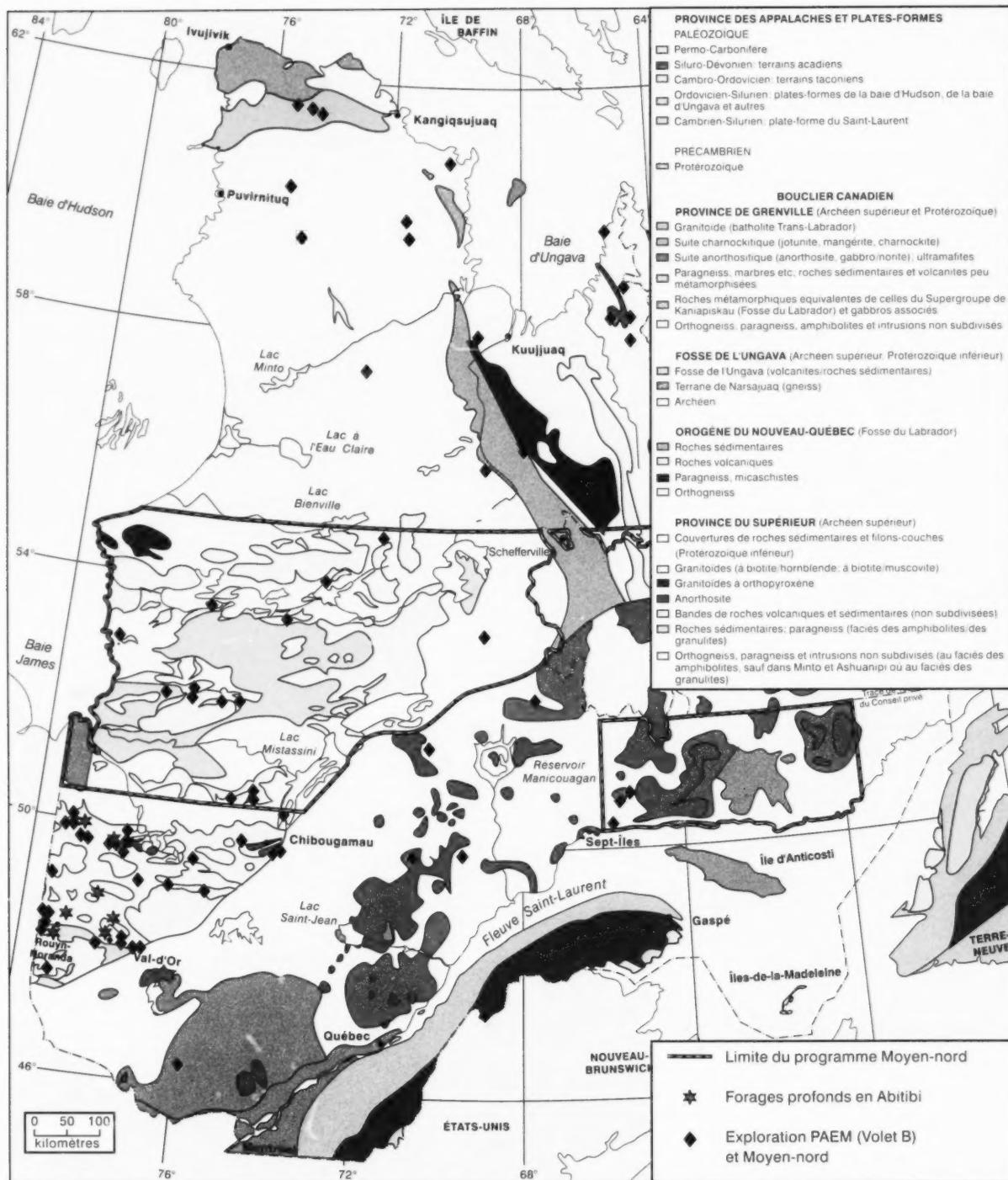


FIGURE 3.2 - Location of company projects subsidized by the MRN in 1998-1999.



Gouvernement du Québec
Ministère des Ressources naturelles
Secteur des mines